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Topic 1. ACTION AGAINST PAYTM PAYMENTS BANK LTD UNDER SECTION 35A OF THE BANKING REGULATION ACT 1949

Important for the subject: Economy

The Reserve Bank of India (RBI) has **imposed restrictions on Paytm Payments Bank effective March 2024** due to concerns about breach and non-compliance with regulatory norms.

Comprehensive System Audit:

- The restrictions follow a **Comprehensive System Audit report and compliance validation report by external auditors**, indicating persistent non-compliances and material supervisory concerns.

Previous Directives:

- In March 2022, the **RBI directed Paytm Payments Bank to stop onboarding new customers and appointed an IT audit firm** for a Comprehensive System Audit.

Prohibited Activities from March 1, 2024:

- Paytm Payments Bank is **barred from accepting deposits, undertaking credit transactions, or facilitating top-ups in customer accounts, prepaid instruments, wallets, FASTags, and NCMC (National Common Mobility Cards) post-February 29, 2024.**

Withdrawal or Utilization of Balances:

- Customers will be **allowed to withdraw or utilize balances without any restrictions up to the available balance**, including from savings and current bank accounts, prepaid instruments, FASTags, and NCMC.

Prohibited Services After February 29, 2024:

- Apart from fund transfers, utilization, or withdrawal, **Paytm Payments Bank is not allowed to provide other banking services, BBPOU (Bharat BillPay Operating Units), and UPI facility after February 29, 2024.**

Settlement of Transactions:

- **Settlement of all pipeline transactions and nodal accounts initiated before February 29, 2024, should be completed by March 15, 2024**, with no further transactions permitted thereafter.

Customer Concerns:

- Following the RBI sanctions, **customers expressed concerns on social media platforms regarding wallet balances, fixed and savings deposits, and the ability to use Paytm for UPI transactions.**

Market Share and Impact:

- Paytm had a **market share of 13% in terms of UPI transaction volumes and 11% in terms of the value of UPI transactions** as of October 2023, and the **restrictions are seen as a negative development with potential impact on the business.**

Business Risks:

- There are potential risks to payments margins, **impact on lending business, and risks to earnings / valuations, especially affecting higher margin products such as wallets and FasTag, which are dependent on the payments bank.**

About Banking Regulation Act, 1949

- The Banking Regulation Act, 1949, is a comprehensive piece of legislation that **regulates and governs the functioning of banking companies in India.**
- It provides the **legal framework for the establishment, operation, and regulation of banks, with the primary objective of safeguarding the interests of depositors and ensuring the stability and soundness of the banking system.**
- The act was initially enacted as the Banking Companies Act, 1949, and **later its name was changed to the Banking Regulation Act, 1949, effective from March 1, 1966.**

RBI's Regulatory Authority:

- The act empowers the Reserve Bank of India (RBI) to **regulate and supervise banks in India. The RBI is granted extensive powers to issue licenses, regulate shareholders' shareholding and voting rights, and oversee various aspects of banking operations.**

Bank Licensing:

- The RBI has the authority to **issue licenses to banking companies, specifying the conditions under which they can carry on banking business.**

Governance and Management:

- The act provides **guidelines for the constitution of boards, the appointment of directors, and the management of banking companies.** It aims to ensure effective corporate governance in the banking sector.

Operations and Business Conduct:

- The act regulates the operations of banks, prescribing certain norms and standards to be followed in areas such as lending practices, investments, and risk management.

Audit and Inspection:

- The RBI has the **power to conduct audits and inspections of banks to ensure compliance with regulatory requirements.**

Control over Moratorium, Merger, and Liquidation:

- The act provides for the **imposition of a moratorium, merger, and liquidation of banking companies under certain circumstances, with the objective of protecting the interests of depositors and maintaining financial stability.**

Public Welfare and Banking Policy:

- The **RBI can issue instructions to banks in the interests of public welfare and banking policy.**

Penalties:

- The act empowers the RBI to impose penalties on banks for non-compliance with regulatory provisions.

Section 35A of the Banking Regulation Act, 1949

- Section 35A of the Banking Regulation Act, 1949, grants the **Reserve Bank of India (RBI) the authority to issue directions to banking companies in order to prevent their affairs from being conducted in a manner detrimental to the interests of depositors or prejudicial to the interests of the banking company itself.**
- This section empowers the RBI to intervene and take regulatory actions to **ensure the stability, proper management, and protection of the interests of depositors in the banking system.**

Directional Power:

- The **RBI can issue directions to banking companies to prevent their affairs from being conducted in a manner harmful to the interests of depositors or prejudicial to the interests of the banking company.**

Regulatory Intervention:

- The section provides the **RBI with regulatory tools to intervene in the operations of a banking company if it believes that certain activities may adversely affect depositors or the institution itself.**

Ensuring Stability:

- The overarching goal of Section 35A is to maintain the stability of the banking sector and protect the interests of depositors.

Governance and Control:

- The RBI can impose restrictions on **banking companies to ensure better governance and control, safeguarding the overall health of the banking system.**
- In the recent case involving Paytm Payments Bank Ltd, the **RBI invoked Section 35A to issue directions and impose restrictions on the bank, citing persistent non-compliances and material supervisory concerns.**

What is a Payments Bank?

- A Payments Bank is a bank that does not offer loans or credit cards. It takes deposits up to Rs 1 lakh from its customers.
- It provides various other financial services such as remittance transfer services, selling of financial products of other banks etc. So a payment bank does not offer loans such as gold loans, business loans, and personal loans.
- But they can sell the loan products and insurance products etc. of other NBFCs and banks.

Topic 2. GOVT WILL FOLLOW THE POLL YEAR TRADITION OF INTERIM BUDGET: PM

Important for the subject: Economy

Interim Budget Tradition:

The Prime Minister stated that the government would “follow tradition” to present the interim Budget. Traditionally, when elections are imminent, the complete Budget is not presented.

- The government expressed its commitment to adhere to this tradition, **implying that a full Budget would be presented after the formation of the new government.**
- More comprehensive Budget would be presented after the formation of the new government.
- Traditionally, **governments entering elections avoid making significant policy announcements in the interim budget.**

Differences Between Interim Budget and Union Budget:

Timing:

- Interim Budget: **Presented just before General Elections.**
- Union Budget: Presented annually in the Parliament.

Approval Process:

- Interim Budget: Vote on account passed without discussion in Lok Sabha.
- Union Budget: Passed after complete discussions in Lok Sabha.

Content – Income and Expenses:

- Interim Budget: **Mentions income and expenses of the previous year, with details for a few months until the next government takes charge.** Sources of income are not detailed.
- Union Budget: **Includes details of income and expenses for the previous year and outlines the government's plan to raise and utilize funds for the nation's development.**

Duration:

- Interim Budget: **Covers approximately 2 to 4 months of the fiscal year (election year).**
- Union Budget: Covers the entire fiscal year.

Detail Level:

- Interim Budget: Provides a **summary of the expenses and income of the previous year.**
- Union Budget: Offers a detailed breakdown of income and expenses for the previous year.

Taxation Component:

- Interim Budget: **Does not have a component detailing income through tax collection.**
- Union Budget: Describes spending on social welfare measures, development, and ways of raising funds through taxes.

Topic 3. TAX BUOYANCY HELPS CENTRE ALIGN WITH ITS FISCAL CONSOLIDATION ROADMAP***Important for the subject: Economy***

The strong growth in **tax revenues reflects the high tax buoyancy**, which works out to be 1.2 in the revised estimates for financial year 2023-24 as against 1.0 in FY23.

- For 2024-25, the tax buoyancy is seen at 1.1.

Trends in the budget:**Direct taxes:**

- **Direct tax revenues** have shown a sharp surge, with income tax seen overshooting the Budget estimate for this financial year by 13.5 per cent
- **The Securities Transaction Tax (STT) revenue** was seen exceeding the budget estimate by 15.8 per cent.
- For the next financial year, **direct tax collections, which include income tax and corporate tax**, are estimated to rise 13.1 per cent to Rs 21.99 lakh crore.
- **Direct tax revenues are estimated to grow 17.2 percent year-on-year to Rs 19.45 lakh crore** in the current financial year 2023-24.
- The income tax collections in 2023-24 have shown a sharp pickup and are expected to exceed the Budget estimate by Rs 1.2 lakh crore.
- Corporate tax collections have been maintained at the Budget estimate level of Rs 9.23 lakh crore.
- **Income tax revenues are seen exceeding corporate tax collections**, even though they had been budgeted at a lower level than corporate tax revenue in the Budget estimates for 2023-24.
- **Securities Transaction Tax**, which is levied on traded securities on bourses, is estimated to increase to Rs 32,000 crore in the revised estimates of 2023-24, an increase of 27.6 percent from the actual revenue in 2022-23.
- For 2024-25, STT revenues are estimated to rise to Rs 36,000 crore.
- The **government's gross tax revenue** is estimated to grow 11.5 percent to Rs 38.31 lakh crore in the next financial year.
- The **Centre's net tax revenues** are estimated to grow by nearly 12 percent to Rs 26.02 lakh crore in 2024-25.
- Over the past few years, the government's revenue collections, especially tax collections, have turned out to be better than budgeted.
- The budgeted tax **revenue buoyancy for FY24 was 1.07x**, but as per FY24 revised estimates, it came in at 1.19x.

Indirect taxes:

- On the indirect taxes side, **Central Goods and Services Tax (CGST)** collections are estimated to grow 13 per cent to Rs 9.18 lakh crore in 2024-25.
- Overall, the indirect tax collections, which include **customs, excise duties and GST (including compensation cess)**, are expected to yield **Rs 16.22 lakh crore to the government in 2024-25**.
- In the current financial year, the revised estimate for **customs and excise duty collections** have been lowered to Rs 2.19 lakh crore and Rs 3.08 lakh crore, respectively,

while **GST collections** (including compensation cess) are estimated at the budgeted level of Rs 9.57 lakh crore.

About Tax Buoyancy:

- It refers to the responsiveness of tax revenue growth to changes in GDP.
- When a tax is buoyant, its revenue increases without increasing the tax rate.
- A similar looking concept is **tax elasticity** which refers to changes in tax revenue in response to changes in tax rate.

Tax buoyancy depends mainly on

- Size of the tax base
- Tax administration regime
- Reasonableness and simplicity of the tax rates
- Wealth creation

Topic 4. INTERIM BUDGET 2024: FOOD, FERTILIZER, FUEL SUBSIDY BILL TO FALL TO 5-YEAR LOW

Important for the subject: Economy

The Centre's subsidy bill on the '**3 Fs**' ie **food, fertilizer and fuel**, is slated to fall to a five-year-low of Rs 3,81,175 crore in 2024-25, as per the Interim Budget.

There are two main drivers for the decline.

- The **first is the discontinuation of the free, additional 5-kg monthly grain allocation** to the 80 crore-plus public distribution system (PDS) beneficiaries under the Pradhan Mantri Garib Kalyan Anna Yojana.

The second driver for the **Centre's lower subsidy outgo is fertilizer.**

Food subsidies:

- The food subsidy is being projected at Rs **2,05,250 crore for 2024-25.**
- The **extra rice or wheat** is over and above the regular 5 kg/person/month PDS quota under the **National Food Security Act** which was given during the post-Covid period from April 2020 to December 2022.
- That ended effective from the **last calendar year.**
- This is down from the **revised estimate (RE) of Rs 2,13,332 crore for this fiscal, Rs 2,72,802 crore for 2022-23 and Rs 2,88,969 crore for 2021-22.**

- Annual grain offtake through the PDS and other schemes falling to 64-65 million tonnes (mt) in 2023-24 (as against 92.9 mt in 2020-21, 105.6 mt in 2021-22 and 92.7 mt in 2022-23).
- The government's procurement as well as stocks in godowns also **declining (translating into reduced carrying cost of buffer beyond operational requirements)**

Fertilizer subsidy:

- The fertilizer subsidy fell to Rs 188,894 crore in 2023-24 and is budgeted even lower at Rs 1,64,000 crore for the coming fiscal.
- The second driver for the **Centre's lower subsidy outgo is fertilizer.**
- This bill soared to a record Rs 2,51,339 crore in 2022-23, following **Russia's invasion of Ukraine in February 2022 that led to skyrocketing international prices of fertilizers and raw materials.**

Fuel subsidies:

- It touched **Rs 96,880 crore in 2012-13 and Rs 85,378 crore in 2013-14.**
- The **petroleum subsidy fell subsequently with benign global crude prices** and the present-day government limiting it only to sale of LPG cylinders and providing connections to poor/low-income households.
- **Retail prices of diesel and petrol have not been revised** since they were last cut on May 22, 2022.
- This has pushed up petroleum subsidy to Rs 12,000 crore levels in the current as well as ensuing fiscal.

Topic 5. BILATERAL INVESTMENT TREATIES (BITS)

Important for the subject: Economy

Finance Minister Nirmala Sitharaman during her Interim Budget speech said that India is negotiating **BITs with trade partners to boost the inflow of foreign direct investments (FDI).**

- A relook at BITs comes at a time when India is pursuing **economic integration with western nations such as the United Kingdom (UK) and the European Union** through free trade agreements and investment treaties.
- For encouraging **sustained foreign investment** there is a need to negotiate various bilateral investment treaties with our foreign partners which will be in the spirit of 'first develop India'

The FDI inflow during 2014-23 was \$596 billion marking a golden era.

- That is **twice the inflow during 2005-14**

About Bilateral Investment Treaties (BITs):

- **Bilateral investment Treaties (BITs)** or Bilateral Investment Protection Agreements (BIPAs) are agreements between two countries for the reciprocal promotion and protection of investments in each other's territories by individuals and companies situated in either State.
- They provide treaty based protection to **foreign investment**.
- The BITs are thus **bilateral agreements by countries to protect the investment** by each country's investors in the other country. Though they are signed by governments, their beneficiaries are business entities.
- **India has inked 86 such bilateral treaties**, the latest being with Brazil in 2020.
- However, there have been many cases of the penalty awarded by an International Dispute Settlement (ISDS) tribunal served against India.
- This led to a review of the **BITs and in 2016 India launched the Model BIT**.
- It aims to act as a base for negotiating new BITs with other States, as well as for re-negotiation of the existing ones.
- Main reason for bringing the **Model BIT was the constant suing of the country by foreign firms**. India was one of the most sued countries during 2015 and 2016.

BITs in India:

- BITs had dipped as a number of trade partners were against India's insistence on favoring '**exhaustion of local remedies**' clause in the model BIT.
- This clause stressed on **resolving investment-related legal disputes locally before going to international arbitration**.
- According to the **World Bank's 'Ease of Doing Business 2020'** report, India ranked 163 out of 190 countries in ease of enforcing contracts and taking 1,445 days and 31 per cent of the claim value for dispute resolution.
- Before the 2015 regime **India had BITs with 83 countries or regions but India suspended BITs with 68 countries/regions** with a request to re-negotiate based on the model 2016 BIT.
- **Foreign direct investment (FDI) equity inflows** in India declined 24 per cent to \$20.48 billion in April-September 2023.
- The total FDI which includes **equity inflows, reinvested earnings and other capital** had contracted 15.5 per cent to \$32.9 billion during the period under review against \$38.94 billion in April-June 2022.

Topic 6. UNION BUDGET 2024-25: NEW INITIATIVE TO BOOST BLUE ECONOMY 2.0 ANNOUNCED***Important for the subject: Economy***

The **interim budget** speech by Union Finance Minister Nirmala Sitharaman emphasized support for **Blue Economy 2.0** through a **new scheme aimed at coastal aquaculture, mariculture, and adaptation measures for climate change.**

- Despite the **lack of detailed budget allocation or specific activities**, this initiative is seen as a **positive step for the livelihoods of 14 million people involved in fisheries** along India's 7,500 km coastline.
- However, there are concerns about **potential maladaptation**, as highlighted by the **IPCC**, which could **inadvertently increase vulnerability to climate change.**
- The speech highlighted the need for **effective adaptation measures** beyond previous efforts, which have sometimes **failed to reduce vulnerability to sea-level rise and extreme weather events**, particularly in **Odisha.**
- Recommended measures include **indigenous seaweed cultivation, artificial reefs, and beach sand dune stabilization** to **protect coastlines and support local livelihoods.**
- **Seaweed cultivation, particularly of indigenous species**, is promoted for its environmental benefits and potential as a **source of proteins for cosmetic production.**

Blue economy:

- The term **Blue Economy** refers to an economy based on **preservation, and regeneration of the marine environment** while sustainably promoting human growth and development.
- The scope of the blue economy was realized by **Gunter Pauli** in "**The Blue Economy: 10 years, 100 innovations, 100 million jobs**".
- In a **blue economy**, the focus would be on preserving marine health as much as it would be on human growth.
- It would also include boosting marine trade and opportunities.
- Other areas of a blue economy would be tourism, renewable energy, the development of fisheries, etc.

Significance of Blue Economy:

- The oceans cover **three-quarters of the earth's surface.** They contain **97%** of the **earth's water.**

- Also, they represent **99%** of the **living area on the planet Earth**. This is one of the reasons why the **blue economy** is significant.
- Oceans help derive **3-5%** of the **world's GDP**. So, a **blue economy** would **promote growth** in the maritime sector.
- Oceans help in maintaining biodiversity and keeping the planet cool. They even absorb **30%** of global carbon dioxide emissions.
- Many income generation modes have been ruled out through sustainable use of the oceans, which can greatly boost economic growth.

Topic 7. EXPOSING INDIA'S FINANCIAL MARKETS TO THE VULTURES

Important for the subject: Economy

In September 2023, J.P. Morgan unveiled its plan to include Indian local currency government bonds (LCGBs) in its Government Bond Index Emerging Markets (GBIEM) Global index suite.

- The inclusion is set to be effective from June 2024, prompting anticipation from other index providers like Bloomberg-Barclays and FTSE Russell.

Bloomberg's Move:

- On January 8, 2024, Bloomberg Index Services proposed the addition of India's "**fully accessible route (FAR)**" bonds to the Bloomberg Emerging Market Local Currency Index.
- This addition is scheduled to take effect in September 2024, aligning with the global trend toward incorporating Indian bonds in benchmark indices.

FTSE Russell's Watchlist and the Call for Reforms:

- FTSE Russell declared India's retention on its watchlist for a potential upgrade, emphasizing the need for reforms in the government bond market as anticipated by global investors.
- The move by J.P. Morgan has triggered a chain reaction among prominent index providers, reflecting a **growing interest in Indian bonds on the global stage**.

India's Initiative for Global Bond Market Integration:

- India initiated the process of incorporating its government bonds into global indices in 2019, officially allowing foreign investors access to a segment of government bonds by 2020 through the introduction of the FAR.
- Despite delays related to capital gains taxes and local settlement, the fundamental policy remained unchanged.

Benefits and Risks Outlined in RBI Report:

- A report by the **Inter-Departmental Group (IDG) of the Reserve Bank of India (RBI)** in October 2022 detailed efforts to internationalize the rupee, emphasizing benefits such as diminishing dependence on domestic institutions and greater stability of funds tracking indices.
- The report acknowledges potential risks but asserts that the perceived benefits outweigh them.

Potential Benefits of Opening Local Bond Markets:

- Opening local bond markets to foreign investors could **facilitate financing of current account and fiscal deficits by engaging institutional investors** with long-term investment horizons.
- It is anticipated that the influx of funds into LCGBs would lower domestic interest rates, reducing the **cost of public borrowing**.

Concerns and Risks Associated with Bond Market Internationalization:

- The **“original sin”** problem is addressed by borrowing in local currency, shifting exchange rate risk onto international lenders.
- However, internationalization entails a significant loss of autonomy for emerging economies in controlling long-term rates and exposes them to greater interest rate risks.

Volatility and Risks in Foreign Portfolio Inflows:

- Foreign portfolio inflows into local currency bond markets (LCBM) are perceived as stable, but they can be volatile due to exchange rate risk borne by investors.
- **Experiences in Malaysia and Türkiye highlight the potential for sudden stops and exits, leading to reserve losses and currency declines.**

Risks Associated with Offshore Markets and Currency Internationalization:

- Malaysia’s experience during the 1997 Asian crisis demonstrates the challenges posed by offshore currency markets, leading to speculative activities and financial distress.
- Türkiye’s recent experience in 2022, with the **offshore lira market in London**, also indicates the potential for speculation against the domestic currency.

Y.V. Reddy’s Perspective and Caution:

- Y.V. Reddy, former Governor of the RBI, emphasizes that currency internationalization requires a **long evolutionary process** and sustained development of the financial system.
- The Indian rupee is yet to be regarded as an international currency, and its internalization is likely to be an outcome of **continued financial system development and improved economic performance**.

Overall Assessment and Caution:

- The internationalisation of bond markets and currencies in emerging economies is often presented as a solution, but the risks involved are underestimated.
- **Increased exchange rate instability and boom-bust cycles in capital flows** may be likely outcomes, posing challenges to managing financial integration effectively.

Topic 8. WHY IS FISCAL CONSOLIDATION SO IMPORTANT?

Important for the subject: Economy

Why in the news?

Recently **Union Finance Minister Nirmala Sitharaman** announced during her Budget speech that the Centre would reduce its fiscal deficit to **5.1% of gross domestic product (GDP) in 2024-25**.

What is the fiscal deficit?

- **Definition:** Fiscal deficit refers to the **shortfall in a government's revenue** when compared to its expenditure.
- When a government's expenditure exceeds its revenues, the government will have to **borrow money or sell assets to fund the deficit**.
- **Fiscal surplus:** When a government runs a fiscal surplus, on the other hand, its revenues exceed expenditure.
- It is, however, quite rare for governments to run a surplus. Most governments today focus on keeping the fiscal deficit under control rather than on generating a fiscal surplus or on balancing the budget.
- **Difference Between debt and deficit:** The fiscal deficit should not be confused with the national debt.
- The national debt is the total amount of money that the government of a country owes its lenders at a particular point in time.
- The national debt is usually the amount of debt that a government has accumulated over many years of running fiscal deficits and borrowing to bridge the deficits.
- **GDP percentage:** The fiscal deficit is generally expressed as a percentage of a country's GDP since it is believed that the figure shows how easily the government will be able to pay its lenders.
- In other words, the higher a government's fiscal deficit as a share of GDP, the less likely its lenders will be paid back without trouble.
- Countries with larger economies can run higher fiscal deficits (in terms of absolute numbers of money).

How does the government fund its fiscal deficit?

Borrowing Mechanism:

- Government borrows money from the bond market to fund its fiscal deficit.
- Lenders, including private entities and central banks, compete by purchasing government-issued bonds.

Central Bank's Role:

- Central banks like RBI are significant players in the credit market.
- RBI may indirectly purchase government bonds in the secondary market from private lenders, creating fresh money through open market operations.

Money Supply Impact:

- RBI's bond purchases can increase money supply, leading to potential inflation in the broader economy over time.

Risk-Free Nature:

- Government bonds are generally considered risk-free as the central bank can create fresh currency under extreme scenarios to repay lenders.
- Governments find it relatively easy to borrow money from the market.

Interest Rate Challenges:

- Government faces challenges not in borrowing itself but in the interest rates it offers.
- Worsening government finances lead to decreased demand for bonds, prompting the government to offer higher interest rates, increasing borrowing costs.

Monetary Policy Influence:

- Central bank lending rates, which were near zero pre-pandemic, have risen post-pandemic.
- Higher central bank rates make it more expensive for governments to borrow, influencing the Centre's efforts to reduce fiscal deficit.

Why does the fiscal deficit matter?

- **Inflation Impact:** A high fiscal deficit is directly linked to inflation, as the government may resort to using freshly issued money to cover the deficit. This can contribute to higher inflation rates.
- **Pandemic Scenario:** The fiscal deficit surged to 9.17% of GDP during the pandemic but has since improved and is expected to drop to 5.8% now.
- **Market Perception:** The fiscal deficit serves as an indicator of the government's fiscal discipline.

- A lower fiscal deficit can enhance ratings for Indian government bonds, signalling responsible financial management.
- **Borrowing Confidence:** Funding more spending through tax revenues and borrowing less builds confidence among lenders, reducing the government's borrowing costs.
- **Debt Management:** A high fiscal deficit can impact the government's ability to manage overall public debt.
- The International Monetary Fund warned of potential risks, projecting India's public debt to exceed 100% of GDP in the medium term, though the government contested this assessment.
- **International Bond Market:** Lowering the fiscal deficit may facilitate the government's efforts to tap into the international bond market, making it easier to sell bonds overseas and access more affordable credit.

What lies ahead?

Fiscal Deficit Target (2024-25):

- The Centre aims to reduce the fiscal deficit to 5.1% of GDP.
- Despite plans for increased capital expenditure and program spending.

Revenue Source:

- Majority of funding for spending plans come from tax collections.
- Expects a significant 11.5% rise in tax collections for 2024-25.

Expenditure Changes:

- Planned reduction in fertiliser subsidy from ₹1.88 lakh crore (2023-24) to ₹1.64 lakh crore (2024-25).
- Projected decrease in food subsidy from ₹2.12 lakh crore (2023-24) to ₹2.05 lakh crore (2024-25).

Economic Growth Concerns:

- Raising tax rates to boost collections may negatively impact economic growth.
- Taxes can act as a dampener on overall economic activity.

Fiscal Deficit Target Challenges:

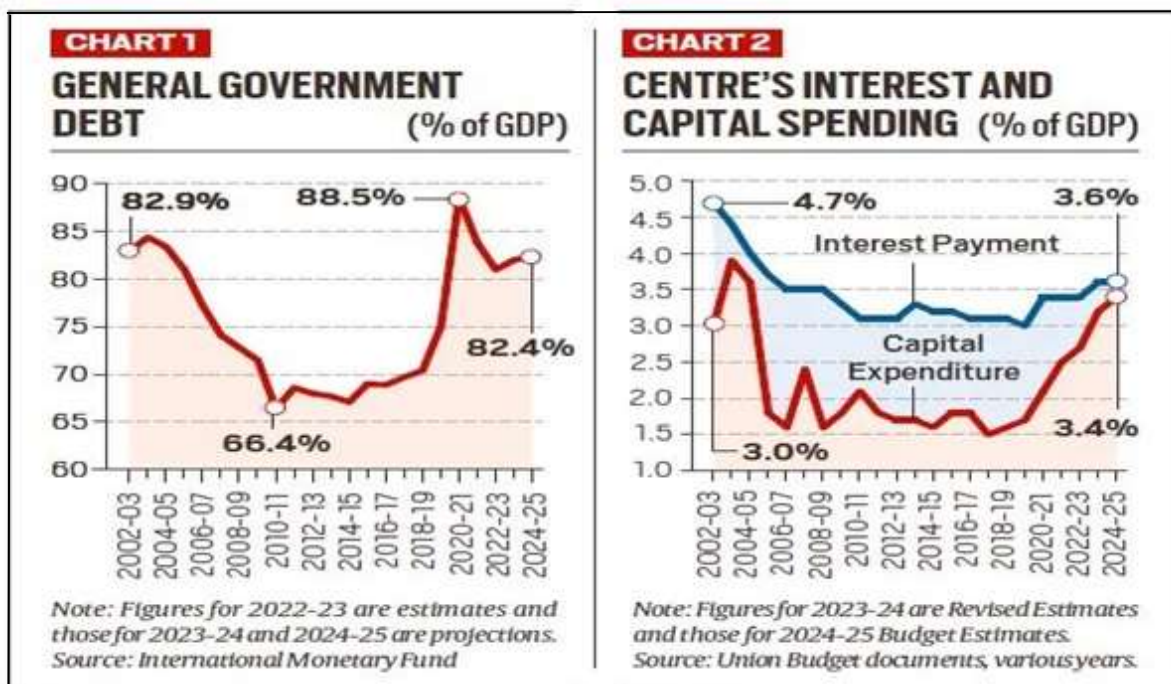
- Ambitious fiscal deficit targets may face challenges.
- Uncertainty as government projections may not align with actual outcomes.

Fiscal Responsibility and Budget Management (FRBM) Act

- The **FRBM Act, 2003**, intends to bring **transparency and accountability** in the conduct of the fiscal and monetary actions of the government.
- The central government agreed to the following fiscal indicators and targets, subsequent to the enactment of the FRBMA
- **Revenue deficit to be eliminated by the 31st of March 2009. A minimum annual reduction of 0.5% of GDP.**
- **Fiscal Deficit to be brought down to at least 3% of GDP by 31st of March 2008. A minimum annual reduction – 0.3% of GDP.**
- The FRBM Act made it mandatory for the government to place the following along with the Union Budget documents in Parliament annually:
 - Medium Term Fiscal Policy Statement
 - Macroeconomic Framework Statement
 - Fiscal Policy Strategy Statement
- The FRBM Act proposed that revenue deficit, fiscal deficit, tax revenue and the total outstanding liabilities be projected as a percentage of gross domestic product (GDP) in the medium-term fiscal policy statement.
- Several years have passed since the FRBM Act was enacted, but the Government of India has not been able to achieve targets set under it. The Act has been amended several times.
- In 2013, the government introduced a change and introduced the concept of effective revenue deficit.
- This implies that effective revenue deficit would be equal to revenue deficit minus grants to states for the creation of capital assets.
- In 2016, **a committee under N K Singh was set up to suggest changes to the Act.**

Topic 9. THREE WAYS TO DEAL WITH THE HIGH GOVT DEBT

Important for the subject: Economy



The Narendra Modi-headed National Democratic Alliance (NDA) government will end its second term with overall public debt in excess of 80% of India's gross domestic product (GDP) at current market prices.

- According to **International Monetary Fund (IMF) data**, general government debt – the combined domestic and external liabilities of both the Centre and the states – **touched 84.4% of GDP in 2003-04**.
- That ratio fell to a **low of 66.4% in 2010-11**.
- It rose gradually to **7% in 2013-14 and 70.4% in 2018-19**.
- The present government's second innings saw the **debt-GDP ratio soar to 75% in 2019-20 and peak at 88.5% in 2020-21**, before easing to 83.8% and 81% in the following two fiscal years (April-March).
- The IMF has projected the ratio at **82% in the current fiscal and 4% for 2024-25**, which is still close to the high levels of the early 2000s.
- General government debt climbed from **7% of GDP in 2019 to 133.5% in 2020 and 121.4% in 2022 for the US**; from **97.4% to 115.1% and 111.7% for France**; from **85.5% to 105.6% and 101.4% for the United Kingdom**; and from **60.4% to 70.1% and 77.1% for China** during these years.

What public debt entails:

- Government debt is basically the **outstanding domestic and foreign loans raised by the Centre and states.**
- It includes **other liabilities, including against small savings schemes, provident funds and special securities issued to the Food Corporation of India, fertilizer firms and oil marketing companies** – on which they have to pay interest and the principal amounts borrowed.
- As per the **Fiscal Responsibility and Budget Management (FRBM) law 2003, the general government debt was supposed to be brought down to 60% of GDP by 2024-25.**
- The Centre's own total outstanding liabilities **were not to exceed 40%** within that time schedule.
- In absolute terms, the Centre's total liabilities have more than doubled from **Rs 90.84 lakh crore to Rs 183.67 lakh crore between 2018-19 and 2024-25.**
- There is a decline in the **interest-to-GDP ratio from a high of 4.7% in 2002-03 to 3.1% by 2010-11.**
- The ratio more or less stabilized at **3-3.1% till 2019-20, before surging to 3.4% in 2020-21 and 3.6% in the current and ensuing fiscal**

Why has debt spiralled?

- The most obvious reason is the **Covid-induced disruptions** that forced governments to borrow more in order to **fund additional public health and social safety net expenditure requirements.**
- The combined gross fiscal deficit of the Centre and the states i.e. the gap between their total spending and revenue receipts went up from **8% and 7.2% of GDP in 2018-19 and 2019-20 respectively, to 13.1% and 10.4% in the next two fiscals.**
- The **Centre's fiscal deficit** alone increased from **4% of GDP in 2018-19 to 4.6% in 2019-20, 9.2% in 2020-21 and 6.8% in 2021-22.**
- The present government, apart from spending more on income and consumption support schemes, also stepped-up public investments in roads, railways and other infrastructure.
- The **Centre's capital expenditure has dropped from 3.9% to 1.5% of GDP between 2003-04 and 2017-18.**
- It revived significantly thereafter to reach **2% in 2023-24 and 3.4% in the Interim Budget for 2024-25.**

How can debt be reined in?

- The **FRBM Act envisaged limiting the Centre's gross fiscal deficit to 3% of GDP by 2020-21.**

- The present government has opted for a new broad “glide path” of fiscal consolidation.
- As per Union Budget speech 2021-22 which aims to attain a **fiscal deficit-to-GDP ratio of “below 4.5%” by 2025-26.**
- While fiscal consolidation can ensure a check on borrowings and not too much being added to the stock of government debt relative to GDP – the IMF has warned against crossing the 100% mark.
- There are two other routes as well for bringing the latter down.

That would involve what one may call the denominator effect.

- Government debt and fiscal deficits are usually quoted as ratios to GDP at current market prices.
- **High nominal GDP growth where the denominator rises faster than the numerator helps in some way in solving the government’s debt problem.**
- GDP growth, in turn, can come from both **real output increases and inflation.**
- The **second and third way to drive down the government debt-to-GDP ratio is to “grow” or “inflate” it away.**
- This actually happened during 2003-04 to 2010-11 when general government **debt plunged from 84.4% to 66.4% of GDP.**
- However, this period incidentally, also witnessed an **average annual GDP growth of 7.4% in real and 15%-plus in nominal terms** after adding inflation.

Topic 10. KEY POINTS FROM CHIEF ECONOMIC ADVISER’S INSIGHTS ON INTERIM BUDGET

Important for the subject: Economy

Fiscal Policy Adjustment:

Chief Economic Adviser V. Anantha Nageswaran emphasizes the **need for fiscal policy to step back as the economy regains momentum.**

- **Advocates a countercyclical fiscal policy, urging a gradual withdrawal of fiscal stimulus to rebuild fiscal space for future needs.**

Global Stimulus Challenges:

- Cites global inflation surprises in 2022-23, **attributing them to prolonged and oversized stimulus worldwide.**
- Highlights the adverse effects of excessive stimulus, drawing parallels with India’s experience in 2010-11 and 2011-12.

Focus on Financial Inclusion:

- Points out the government's **commitment to financial inclusion and support for the poor, evident in the extension of the PM Gareeb Kalyan Anna Yojana.**

Budget Strategy and GDP Target:

- Attributes the interim budget strategy to the government's commendable 10-year track record.
- Advocates sticking to the framework of a vote on account, **projecting a fiscal deficit target of 5.1% of GDP.**

Next-Generation Reforms:

- Identifies **priorities for future reforms, including health, learning outcomes, MSME compliances, and mentions next-generation reforms** in the budget.
- Emphasizes the **importance of consultations and consensus-building with state governments for effective reforms.**

State-Level Reforms:

- Highlights that many reform areas, such as **health, learning outcomes, skilling, land reforms, and labor codes, fall within the purview of state governments.**
- Stresses the need for state-center collaboration in these crucial areas

Energy Security and Discom Viability:

- Addresses the significance of energy security in the context of the **energy transition, emphasizing the viability of distribution companies (discoms).**
- Calls for economic viability and transparent recovery of user charges for discoms, suggesting targeted subsidies if required.

GST Rate Rationalization:

- Advocates periodic reviews, **including GST rate rationalization by the GST Council.**
- Stresses the importance of comprehensive perspectives in **reviewing perpetual policies like GST and the Insolvency and Bankruptcy Code**

Regulatory Institutions and Frameworks:

- Supports periodic reviews of regulatory institutions and frameworks, **suggesting a sunset clause for policies.**

Some Regulatory Reforms and Next-Generation Reforms:**Regulatory Reforms:****Focus on MSMEs:**

- Need for regulatory reforms, particularly for Micro, Small, and Medium Enterprises (MSMEs).
- Aim to **enhance ease of doing business and reduce regulatory burdens**.

Next-Generation Reforms:

- **Avoiding Middle-Income Trap:**
- Targeted at preventing the middle-income trap.
- **Emphasis on decentralization and flexibility.**

Sectors for Liberation:

- May call for freeing up sectors like **agriculture and energy with distorted markets**; aims to avoid economic stagnation and promote growth.

Enhancing Transparency:

- Greater transparency in land markets.
- Complete **digitization of land records** for efficient management.

Application of AI:

- Establishment of a framework for the application of Artificial Intelligence (AI).

Incorporating AI to boost efficiency in various sectors.

Fine-Tuning GST:

- Rationalisation of Goods and Services Tax (GST).

Governance and Administrative Reforms:

- Potentially **advocates administrative reforms, including civil service specialization**; Possible **emphasis on specialization within civil services for effective governance**.

Overall Solutions for a New India

Tax Cuts and Rebates:

- Designed to increase consumer spending.
- Government's **reduction in corporation tax rates to stimulate economic growth**.

Deregulation for Economic Stimulus:

Relaxing rules and regulations on industries and businesses.

- Deregulation in 1991 led to economic development; needs regular implementation.
- Example: Disinvestments of loss-making PSUs.

Infrastructure Spending for Growth:

- **Investing in roads, bridges, ports, and sewer systems.**
- Enhances productivity, creates jobs, and fosters economic growth.

Broader Measures for a “Major Economic Powerhouse”:**Growth:**

- Increase investment rates to 36% of GDP.
- Raise tax-GDP ratio to 22%.
- Improve ease of business, rationalize land & labor regulations.

Employment and Labor Reforms:

- Fully codify central labor laws.
- **Increase Female Labor Force Participation to 30%.**
- Enhance employability through health, education, and skilling.

Doubling Farmers’ Income:

- Modernize technology, increase productivity.
- **Abolish APMC, create modern rural infrastructure.**
- **Link production to processing, set up procurement centers.**

Energy:

- Include oil, natural gas, electricity, and coal under GST.
- Promote smart grid and smart meters.

Logistics:

- **Develop IT-enabled platform for transport integration.**
- Rationalize tariffs and determine efficient prices.

Rationalizing GST:

- **Inclusion of petroleum products in GST.**
- Addressing the Inverted Duty Structure issue.
- Faster processing of GST refunds for exporters.

Conclusion:

- Crucial internal reforms needed for India's international leadership.
- Reorganization of the health system with a **focus on primary medical centers (PMCs)**.
- **Aiming for slower but inclusive growth to benefit the majority.**
- Aspiring for **double-digit growth to address employment challenges and become an upper-middle-income economy**

Economic Reforms in India: Key Points

Initiation in 1991:

- Economic reforms in India commenced in 1991.
- Signified a shift from a dominant state role to an increased role for the private sector.

July 23, 1991: Historic Reforms:

- Responded to fiscal and balance-of-payment crises.
- Changes aimed at transforming the economy's face and nature.

Evolution from 1980s to 1990s:

- Reforms in the 1980s were limited; comprehensive changes started in the early 1990s.
- **Criticized for being influenced by the 'Washington Consensus,' impacting the economy negatively.**

Reform Measures:

- Two categories: Macroeconomic Stabilization Measures and Structural Reform Measures.
- Focus on boosting aggregate demand and enhancing the aggregate supply of goods and services

Liberalization (LPG):

- Liberalization, Privatization, Globalization (LPG) characterize India's reform process.
- Liberalization represents a shift towards capitalism, balancing the state-market mix.

Privatization:

- Involves the transfer of state assets to the private sector.
- Various interpretations, including de-nationalization and disinvestment.

Globalization:

- Economic integration among nations.
- WTO's definition emphasizes unrestricted cross-border movements of goods, services, capital, and labour.

Generations of Reforms:**First Generation (1991–2000):**

- Promotion to the private sector, public sector reforms, external sector reforms, financial sector reforms, and tax reforms.
- **Shift towards a market-driven economy and increased private sector participation.**

Second Generation (2000–01 onwards):

- Factor Market Reforms, public sector reforms, reforms in government and public institutions, legal sector reforms, and reforms in critical areas.
- **Emphasizes deeper changes and increased political will.**

Third Generation:

- Focus on fully functional Panchayati Raj Institutions (PRIs) for inclusive growth.
- **Acknowledgment of the need for grassroots involvement in development.**

Fourth Generation:

- Unofficially coined term in 2002.
- Encompasses **information technology-enabled reforms, highlighting a two-way connection between economic reforms and IT.**

Gradualist Approach:

- India's reform process characterized as gradualist, **with occasional reversals and no major ideological U-turns.**
- Reflects the pluralist and participative democratic policy-making process.
- Challenges include the need for more comprehensive reforms and addressing inclusivity.

Topic 11. RBI MONETARY POLICY PREVIEW: KEY POINTS***Important for the subject: Economy*****Repo Rate Expectations:**

Likely to Remain Unchanged: **RBI's Monetary Policy Committee (MPC) expected to maintain the repo rate at 6.5% for the sixth consecutive time.**

- **Steady Repo Rate: If maintained, it would mark a year of the repo rate remaining steady.**

Monetary Policy Stance:

- Expected as 'Withdrawal of Accommodation': The monetary policy stance likely to remain as a **'withdrawal of accommodation.'**
- Consistent with Inflation Targets: Focus on **maintaining CPI inflation at the 4% target.**

Inflation Scenario:

- December CPI Inflation: Increased to 5.69%, a four-month high, driven by higher food prices.
- Government's Band: Inflation within the 2-6% band but above the 4% target. RBI's Projection for FY24: **CPI inflation at 5.4%, with Q3 at 5.6% and Q4 at 5.2%.**

GDP Growth Forecast:

- RBI's FY24 Forecast: Real GDP growth at 7%.
- Optimistic on Growth: **RBI likely to sound optimistic on growth, recognizing fiscal consolidation.**

Liquidity Measures:

- Expectations: Some economists expect RBI to announce liquidity measures to address tight liquidity conditions.
- Liquidity Gap: Gap between incremental credit and deposit in FYTD 2024 is Rs 3.6 lakh crore.

External Benchmark Lending Rates (EBLR):

- Linked to Repo Rate: **If repo rate remains unchanged, EBLRs linked to it will not rise.**
- Relief to Borrowers: **Borrowers' EMIs will not increase for loans linked to EBLRs.**

MCLR-Linked Loans:

- Possible Rate Hike: **Lenders may raise interest rates on loans linked to MCLR.**
- Incomplete Transmission: **Full transmission of the previous repo rate hikes not observed in MCLR-linked loans.**

Future Rate Expectations:

- Nomura's View: Expects 100 bps of rate cuts, starting from August, with risks of earlier cuts.
- Goldman Sachs' View: Expects RBI to keep the policy repo rate unchanged until Q3 of CY24.

Monetary Policy Stance in April:

- Expected Timing: **A formal change to the monetary policy stance may be considered in April.**

- Current Liquidity Management: **RBI likely to actively manage liquidity with the existing stance.**

Overall Impact on Borrowers:

- EBLR-Linked Loans: **No immediate increase in EMIs.**
- MCLR-Linked Loans: **Potential for interest rate hikes, impacting EMIs for these loans.**

About Internal Benchmark Lending Rate (IBLR):

- **Lenders establish an internal benchmark rate for determining interest rates on loans.**
- Several benchmark rates were introduced over the years, **including BPLR, Base Rate, and MCLR.**
- These rates aimed to ensure transparent and efficient pricing in the lending market.

Issues with IBLR Regime:

- **Banks often did not pass on the full benefits of RBI's repo rate cuts to borrowers.**
- **Complex internal variables within the IBLR-linked loans hindered the seamless transmission of policy changes.**

BPLR (Benchmark Prime Lending Rate):

- Used as a benchmark rate by banks for lending until June 2010.
- Loans were priced based on the actual cost of funds.
- The rate varied across banks and depended on the cost of funds, among other factors.

Base Rate:

- Replaced BPLR and was used for loans taken between June 2010 and April 2016.
- Considered the minimum interest rate at which commercial banks could lend to customers.
- Calculated based on the cost of funds, unallocated cost of resources, and return on net worth.

MCLR (Marginal Cost of Funds based Lending Rate):

- Introduced in April 2016 as a benchmark lending rate for floating-rate loans.
- Considers the marginal cost of funds, negative carry on account of the cash reserve ratio, operating costs, and tenor premium.
- Linked to actual deposit rates, ensuring that when deposit rates rise, MCLR increases and lending rates go up accordingly

External Benchmark Lending Rate (EBLR):

- RBI mandated the **adoption of a uniform external benchmark by banks from October 1, 2019**, it was intended to plug the deficiencies in MCLR.
- Four external benchmarking mechanisms were introduced, RBI repo rate, 91-day T-bill yield, 182-day T-bill yield, any other benchmark market interest rate as developed by the Financial Benchmarks India Pvt. Ltd.
- Banks have the flexibility to set the spread over the external benchmark, with interest rate resets required at least once every three months.

Significance of EBLR:

- Aims to facilitate faster and effective transmission of monetary policy changes.
- Enhances transparency in interest rate setting and standardizes the process of fixing interest rates for different loan categories.
- Introduces a more dynamic and responsive lending environment in line with the objectives of the RBI's monetary policy framework.

Topic 12. KEY POINTS: IMPORT DUTY HIKE ON GOLD FINDINGS

Important for the subject: Economy

Import Duty Hike Background:

Category Affected: Import duties increased on a specific category of jewelry called “gold findings.”

- **Definition:** Gold findings include small components like **hooks, clasps, clamps, pins, screws used in jewelry.**
- **Reason for Hike:** A surge of over 5,000% in gold findings imports during the current financial year (up to January 6).
- **Import Value:** Imports rose to Rs 5,212 crore, over 50 times higher than the previous year.

Import Duty Changes:**Earlier Rates:**

- Gold and silver findings faced an 11% import duty.
- Gold and silver bars attracted a 15% import duty.

New Rates (Effective from January 22, 2024):

- Gold and silver findings: **AIDC of 5%, SWS removed, BCD unchanged at 10% (Total effective duty: 15%).**
- Gold and silver bars: **Continue to have a 15% import duty.**

Reasons for Duty Hike:

- **Misuse of Duty Arbitrage:** Importers exploited duty differences between gold and silver bars and findings by importing gold in the form of findings and coins.
- **Concerns about Evasion:** The sharp increase in gold findings imports raised concerns about duty evasion.

Loophole Closure Attempts:

- **Coins of Precious Metals:** Import duty on coins of precious metals increased from 11% to 15% to prevent lower duty for other forms of precious metals.
- **Spent Catalyst and Ash:** Import duty hiked to 14.35% (including 10% BCD and 4.35% AIDC) to align with gold and silver ore.

Import Duty Rates Equalization:

- Duty rates on gold and silver findings equalized with gold and silver bars to prevent circumvention from higher duty on bars.

Impact on Gold Imports:

- **Recent Trends:** Gold imports surged, rising by 95% YoY to \$7.23 billion in October, and rose by 23.01% YoY to \$29.48 billion during April-October.
- **Government Action:** Import duty hike as a measure to manage and control the surge in gold imports.

Overall Objective:

- **Addressing Duty Arbitrage:** The duty hike aimed at curbing the misuse of duty differences and ensuring uniform duty rates across related gold and silver categories.

Smuggling Concerns:

- **Gold Price Impact:** Elevated gold prices and high import duty seen as contributing factors to increased smuggling cases.
- **Control Measures:** Import duty adjustments as part of efforts to manage smuggling risks.

Effective Date:

- The new duty rates, including the **Agricultural Infrastructure Development Cess (AIDC)** and the removal of **Social Welfare Surcharge (SWS)**, became effective from **January 22, 2024**.

Social Welfare Surcharge (SWS) Introduction:

- Introduced in the Finance Budget of 2018.
- Established under Section 110 of the Finance Act 2018

Purpose:

- Designed to **support the Government's commitment to education, health, and social security.**
- Aims to **contribute to social welfare initiatives.**

Levy and Calculation:

- **Levied at 10% of the aggregate of duties, taxes, and cesses.**
- Adds an extra layer of cost to customs duties on imported items.
- **Plays a crucial role in determining the total amount payable by importers.**
- In summary, the **Social Welfare Surcharge is a special levy imposed on imports aimed at supporting social welfare initiatives such as education, health, and s**
- It is calculated as 10% of the aggregate of duties, taxes, and cesses, adding an additional cost to imported goods.

Topic 13. ABOUT AGRICULTURE INFRASTRUCTURE AND DEVELOPMENT CESS (AIDC)

Important for the subject: Economy

Introduction and Nature:

Introduced in the Union Budget 2021-22.

A tax imposed by the government on the commercial production of agricultural produce.

- Levied at a **specific rate on the value of these goods.**

Purpose:

- Aims to **provide financial support for the development of agricultural infrastructure in India.**
- Funds collected utilized for creating and maintaining agricultural infrastructure like cold storage facilities, warehouses, and market yards.
- Objective is to **enhance the efficiency of the agricultural sector and improve farmers' income.**

Collection:

- Government collects AIDC at the point of sale or import of applicable goods.

What is a Cess?**Definition:**

- A form of tax charged/levied over and above the base tax liability.
- Imposed when the government seeks to raise funds for specific purposes.

Purpose:

- Typically imposed to **generate additional revenue for funding specific projects or sectors.**
- **Examples include education cess for funding education.**

Difference between Tax and Cess:**Tax vs. Cess:**

- Cess is imposed additionally to existing taxes.
- Taxes go to the Consolidated Fund of India (CFI), while cess is earmarked for a specific purpose.

Usage of Funds:

- Cess collected must be used only for the intended purpose and cannot be reallocated.
- Unspent funds carried over to the next year for the same cause.

Government Allocation:

- Unlike some taxes, the central government retains the cess and does not need to share it with state governments.

Topic 14. HOT MONEY***Important for the subject: Economy***

India to stay alert for 'hot money' after bond index inclusion: official

- Hot money refers to the **currency that quickly and regularly moves between financial markets and is invested for short-term.**
- In this investors lock in the highest available short-term interest rates for large gains.
- It is less flexible and bring in volatility in economy (Ex- FPI is often referred to as "hot money" because of its tendency to flee at the first signs of trouble in an economy.).
- Banks usually attract "hot money" by offering relatively short-term certificates of deposit (CD) that have above-average interest rates.
- As soon as the institution reduces interest rates or another institution offers higher rates, investors with "hot money" withdraw their funds and move them to another institution with higher rates.

Topic 15. 'TAX-TO-GDP RATIO TO HIT ALL-TIME HIGH OF 11.7% OF GDP IN FY25'

Important for the subject: Economy

India's tax landscape is anticipated to witness significant growth in the coming fiscal year, with the tax-to-GDP ratio expected to reach a **historic high of 11.7%**.

About 'Tax-to-GDP' Ratio

- The tax-to-GDP ratio measures a nation's tax revenue relative to the size of its economy.
- This ratio is used with other metrics to determine how well a nation's government directs its economic resources via taxation.
- **Developed nations typically have higher tax-to-GDP ratios** than developing nations.
- Higher tax revenues mean a **country can spend more on improving infrastructure, health, and education**—keys to the long-term prospects for a country's economy and people.
- According to the World Bank, tax revenues above 15% of a country's gross domestic product (GDP) are a key ingredient for economic growth and poverty reduction.

What led to this growth?

Direct Tax Collection

- **Optimistic Outlook:** Revenue Secretary anticipates a rise in the adoption of the **new tax regime, characterized by simplified tax structures and a higher tax-free income threshold**.
- **Growth in Personal Income Tax:** Personal income tax collections have witnessed a substantial 28% growth, with a projected moderation to 20%-22% by the fiscal year-end.

Rationalizing GST Rates

- **Ongoing Review:** A Group of Ministers (GoM) appointed by the GST Council is reviewing the rate structure, aiming to rationalize GST rates on various items.
- **Quarterly Meetings:** The GST Council is expected to convene regularly to address rate rationalization, although no fixed date has been announced yet.

Projected Revenue Growth

- **Modest Projections:** Despite a buoyant revenue growth of 1.4% this year, projections for the following fiscal year aim for a 1.1% buoyancy, aligning with an anticipated nominal GDP growth of 10.5%.
- **Corporate Tax Dynamics:** The deadline for availing the reduced corporate tax rate ends in March 2023, with a significant proportion of companies already benefitting from it.

- **Enforcement Measures:** While the Department of Revenue focuses on tax administration, the Enforcement Directorate intervenes in cases related to money laundering, ensuring comprehensive enforcement mechanisms.

Topic 16. WHAT CAN LICHENS TELL US ABOUT ATMOSPHERIC POLLUTION?

Important for the subject: Environment

During 2000s, in **Kodaikanal**, the protests were triggered by a **thermometer factory** near **Kodaikanal Lake**, owned by **Hindustan Unilever**, which was found to be **polluting the environment with mercury through improper waste disposal**.

- This **pollution** affected the **soil, water, and air** in the area. The **factory's illegal activities** were exposed, leading to penalties.
- A key evidence in the **mercury poisoning case** was the discovery of **mercury in lichens**, a **plant-like substance**, around the factory.

What are lichens?

- **Lichens** are unique organisms often seen on **tree barks and rocks** in **moist environments**, contributing to the beauty of landscapes like the **Himalayas** with their varied colours.
- They are **formed** from a **mutualistic relationship** between a **fungus** and a **photosynthetic partner** (algae or cyanobacteria), as described by the **British Lichen Society**.
- The **fungus** provides a **protective cover**, while the **photosynthetic partner** contributes organic compounds through **photosynthesis**.
- **Lichens** thrive in various environments, from **mountains** to **Arctic tundras**, and **absorb water and nutrients** directly from the atmosphere.
- This **direct absorption** makes them **sensitive to air pollution**, leading to **damage and bleaching**.
- **India** is **home** to about **3,000 lichen species**, some with **medicinal properties** such as **antibacterial, anti-inflammatory, and anti-cancer effects**.
- A notable example is **Parmotrema perlatum** (**black stone flower**), used by **tribals** for medicinal purposes and as a flavour enhancer in **Indian cuisine**, including **biryani**.

Why are lichens considered good biomonitors?

- **Lichens** are **resilient to pollution** and are used as **biomonitors** and **bioindicators** due to their **sensitivity** to environmental changes.
- They are essential for **monitoring air quality** and **ecological health**. Scientists use both **living** and **non-living entities** to **assess environmental quality** and **pollution levels**.

- **Bioindicators** are organisms that provide information about **environmental quality**, while **biomonitors** also give **quantitative data** about **environmental conditions**.
- For example, **fish** are **excellent bioindicators for aquatic ecosystems**, revealing the health of these systems through their **tissues, blood, and structural anomalies**.
- However, **not all bioindicators are biomonitors**. While fish can indicate the health of an environment, they don't provide quantitative data on pollutant levels.
- In contrast, **lichens** and **mosses** are **effective biomonitors** because **they can both indicate environmental quality and be analyzed to measure pollution levels**.

How are lichens studied in the scientific world?

- Scientists assess **environmental damage** to **lichens** using **parameters** like **photosynthesis, chlorophyll content and degradation, ATP decrease, ethylene production, and membrane damage**.
- **Lichens** have shown a **positive correlation** between their **sulfur content** and **atmospheric sulfur dioxide levels**. Exposure to **vehicular and urban emissions** also alters their **chlorophyll concentration**.
- **Lichens** are used to **analyze atmospheric conditions** and can **estimate the age of the surfaces they colonize**.
- **Studies on lichens** are also crucial for understanding their response to **global warming**. A **2022 study** suggests that **lichens might struggle to adapt to a one-degree Celsius temperature increase within a million years**.
- While **lichens** are **diverse in India**, they are primarily studied for academic purposes. In contrast, **European countries** integrate **lichen studies** into **air pollution policy documents**.

Topic 17. WHILE BANNI READIES FOR CHEETAH, NATIVE PASTORALISTS DEMAND LAND RIGHTS

Important for the subject: Environment

Over a year after starting **India's cheetah reintroduction project**, plans are underway to **establish a cheetah breeding and conservation centre** in the **Banni grasslands of the Great Rann of Kutch in Gujarat**.

- The **Banni grasslands** were initially considered for **wild cat reintroduction** and deemed capable of supporting over **50 cheetahs** by the **Wildlife Institute of India** and the **Wildlife Trust of India**.
- Historical records from **1839** and **1872** suggest the presence of **Asiatic cheetahs** in **Banni**, indicating its potential as a suitable habitat.

- However, the **Banni grasslands** were not initially chosen for **cheetah reintroduction** due to **low prey density**.
- Efforts to **rejuvenate** the **grasslands** focused on **removing invasive plants** and **planting native grass**, but significant steps to **increase prey density** were not taken.
- The government's proposal for a **breeding centre** was **approved** by the **National Compensatory Afforestation Fund Management and Planning Authority**.

Impact on a pastoralist community:

- **Banni**, the **largest grassland in Asia**, spans 2618 sq km and is home to **about 40 different grass species**.
- Due to challenging **climatic conditions** and **soil salinity**, **agriculture is limited**, making **animal husbandry** the **primary livelihood** for the region's inhabitants.
- Around **45,000 people**, mostly from the **Maldhari pastoral community**, reside in **Banni's 48 villages**, along with over 1.5 lakh cattle.
- The **daily milk yield** from the **local Banni buffalo breed** is estimated to be over **1.5 lakh liters**.
- Following the government's announcement of a **cheetah breeding center in Banni**, the **Banni Breeders Association**, representing breeders from all Banni villages, expressed **opposition due to the lack of consultation in the decision-making process**.
- While the breeding center itself is not the main concern, the **Maldharis** fear potential threats to their **traditional livelihoods** and the **well-being of the Banni buffalo**.
- The community is apprehensive about **losing their land to government initiatives**.
- The **grass restoration project** of the **state government** in **2019** had the **forest department** restore 800 to 3900 hectares of land every year.

Topic 18. KANGAROO LIZARD SPECIES DISCOVERED IN WESTERN GHATS

Important for the subject: Environment

The biodiverse forests of the Western Ghats have thrown up yet another marvel of evolution—a new species of tiny lizards, which researchers have described as “**diminutive dragon**”.

About kangaroo lizard species:

- Researchers named the new, scaly reptiles after the Evolutionarily Distinct and Globally Endangered of Existence (EDGE) program through the Zoological Society of London.
- The new species *Agasthyagama edge* or the northern kangaroo lizard belongs to the Agamidae family.

- A group of scientists discovered the new species from the southern Western Ghats at Kulamavu in Idukki.
- The species is the **second one of the Agasthyagama genus after A. beddomii or Indian kangaroo lizard** that has been previously reported from Sivagiri hills in Tamil Nadu.

Some Distinct Features

- A reduced **fifth toe makes these reptiles poor climbers** and hence do not climb trees like other lizards.
- Instead, they are mostly terrestrial and found in areas with dense leaf litter cover.
- They feed on small insects, this variety of kangaroo lizard runs fast and hides within dry leaves to evade predators.
- It is known to have a maximum snout-vent length of 4.3 cm.

Topic 19. WORLD WETLANDS DAY 2024 CELEBRATED AT SIRPUR LAKE, A RAMSAR SITE IN INDORE

Important for the subject: Environment



The Ministry of Environment, Forest & Climate Change (MoEF&CC) in collaboration with Government of Madhya Pradesh, **organized a national event at Sirpur Lake, Indore** through Indore Municipal Corporation and Environmental Planning & Coordination Organisation (EPCO), Government of Madhya Pradesh to celebrate **World Wetlands Day (WWD) 2024**.

- The theme of WWD-2024 is **‘Wetlands and Human Wellbeing’** which underscores the **critical role wetlands play in enhancing our lives**.

- It highlights how **wetlands contribute to flood protection, clean water, biodiversity and recreational opportunities**, all of which are essential for human health and prosperity.
- Three publications were also released during the event including revised guidelines for **‘National Plan for Conservation of Aquatic Ecosystems (NPCA)’**, **‘Management Effectiveness Tracking Tool: A Practitioners’ Guide’**, and a **Compendium on Phyto-diversity of Ramsar Sites in India’**.
- The NPCA Guidelines 2024 provides specific guidance to the State/UT Wetland Authorities.
- Ramsar Site managers and knowledge partners on the regulatory framework of wetland management in India including **Framework Management Plan structure and steps to be followed for its preparation**.
- The compendium, developed by Botanical Survey of India, includes the rapid assessment of plant diversity in and around all the **75 Ramsar Sites of India under the aegis of Amrit Dharohar initiative of MoEF&CC** and the practitioners guide is a self-appraisal tool to support adaptive wetland management and assess progress over time.

Two brochures were also released that included a brochure titled ‘Wetlands Conservation:

- **Approach and Initiatives’** that highlights Government of India initiatives on wetlands conservation since its inception.
- The second brochure, **‘People’s Documentation of Biodiversity of 75 Ramsar Sites’** gives an overview of the Biodiversity Management Committees (BMCs) situated around Ramsar Sites.
- A series of educational videos developed jointly by **MoEF&CC and Central Institute of Educational Technology (CIET)**.
- NCERT were also launched for sensitizing primary, middle and senior level school students on the importance of wetlands conservation and management.

About World Wetlands Day (WWD):

- **World Wetlands Day is observed on 2nd February every year** worldwide to commemorate the signing of the Ramsar Convention on Wetlands of International Importance in 1971.
- India has been a party to the **Convention since 1982 and on the eve of WWD 2024, India has increased its tally of Ramsar sites (Wetlands of International Importance) to 80 by designating five more wetlands as Ramsar sites.**

- Three of these sites, **Ankasamudra Bird Conservation Reserve, Aghanashini Estuary and Magadi Kere Conservation Reserve** are located in **Karnataka** whereas two, **Karaivetti Bird Sanctuary and Longwood Shola Reserve Forest** are in **Tamil Nadu**.
- With the addition of these five wetlands to List of Wetlands of International Importance, the total area covered under Ramsar sites is now 1.33 million ha which is an increase of 5,523.87 ha from existing area (of 1.327 million ha).
- **Tamil Nadu continues to have the maximum number of Ramsar Sites (16 sites) followed by Uttar Pradesh (10 sites).**
- India now has **80 Ramsar sites covering an area of 1.33 million hectares.**
- India added five more Ramsar sites to its portfolio ahead of this year's World Wetlands Day on **February 2, taking its total tally to 80 from the existing 75.**
- The Ramsar Convention sets nine criteria for identifying Wetlands of International Importance.
- These include sites containing representative, rare or unique wetland types and sites of international importance for conserving biological diversity.



About Newly Added Sites:

The Karaivetti Birds Sanctuary in Tamil Nadu:

- The Karaivetti Birds Sanctuary in Tamil Nadu spans over 453 hectares and **“is one of the most important freshwater** feeding grounds for migratory water birds in the state of Tamil Nadu.
- It hosts over **188 bird species, of which 82 are water birds.**
- Apart from water birds, the sanctuary is also an important nesting site for threatened species like the spotted eagle and the tawny eagle.

- The Karaivetti Bird Sanctuary is an important **nesting site for the threatened spotted eagle.**

The Longwood Shola Forest in the Nilgiris (TamilNadu)

- The Longwood Shola Forest in the Nilgiris is among the “**last vestiges of urban shola forest**, where everything else has been lost to tea cultivation and other land use changes.
- The shola is a high-altitude wetland that acts as a water source for 18 villages downstream.
- It is also **considered an Important Bird Area (IBA)**, hosting several **endemic bird species.**
- **The Longwood Shola is recognised and protected as a Reserve Forest.**

Aghanashini Estuary Karnataka:

- The mangroves along the **Aghanashini river “act as a nursery for fishes and prawns.**
- It is considered an important fish **breeding and spawning area.**
- Several species of fish visit nutrient rich mangrove areas for laying eggs so that the juveniles grow amidst abundance of food before they leave for the sea.
- The mangroves that flank the Aghanashini river serve as crucial nurseries for fishes and prawns and play a vital role in their breeding and spawning processes.

Magadi Kere (Karnataka)

- **Magadi Kere Conservation Reserve, is a human-made wetland** with an area of nearly 50 hectares which was constructed to store rainwater for irrigation purposes.
- It is home to over **166 species of birds, of which 130 are migratory.**
- It is one of the largest wintering grounds for **bar-headed goose in southern India**



Ankasamudra Reserve (Karnataka)

- It is **also an artificial tank.**

- It is home to 210 species of plants, 8 species of mammals, 25 species of reptiles, 240 species of birds and 41 species of fishes, apart from frogs, butterflies and other insects.
- The Site is a human-made wetland built for storing monsoon run-off water coming from the **Tungbhadra River and providing irrigation to surrounding drought-risk areas.**
- The Site is widely known for its rich bird diversity and has been declared as a conservation reserve, **managed mainly for bird protection.**



About Sirpur Lake Indore:

- Sirpur Lake was created by the Holkars of Indore State in the early 20th century.
- The lake was recognized by **BirdLife International as one of the 19 important bird areas (IBAs) of Madhya Pradesh in 2015.**
- In July, 2022, **the Sirpur wetland was declared a Ramsar site.**
- Another IBA near Indore is Yashwant Sagar, which was also declared a **Ramsar site in August, 2022.**



About Amrit Dharohar initiative:

- The **Amrit Dharohar** initiative is a part of the 2023-24 budget announcement.
- It was **launched by MoEF&CC during June 2023** to promote unique conservation values of the Ramsar Sites in the country while generating employment opportunities and supporting local livelihoods.

- This initiative is to be implemented over three years in convergence with various **Central Government ministries and agencies, State Wetland Authorities, and a network of formal and informal institutions and individuals, working together for a common cause.**

Topic 20. WORLD WETLANDS DAY 2024: BEFORE WE SAVE THEM, WE HAVE TO KNOW WHERE THEY ACTUALLY ARE

Important for the subject: Environment

The **wetlands in Uttar Pradesh**, constituting about **90% outside protected areas**, are facing significant **threats** due to **encroachments and conversion into real estate**.

- Till October 2023, as many as **75 wetlands** in the country have been categorised as **Ramsar sites**, out of which **10** are in **Uttar Pradesh**.
- The **first national inventory of wetlands** was prepared by the **Space Applications Centre of the Indian Space Research Organisation (ISRO), Ahmedabad** using remote-sensing satellite data from **1992-93**.
- In **2007**, the **Space Application Centre** prepared another **digital database of wetlands** under “**National Wetland Inventory and Assessment**” using remote-sensing techniques.
- Many wetlands are formed by **oxbow lakes (U-shaped lakes)**, which in turn formed naturally by the meandering streams.
- The **Wetlands (Conservation and Management) Rules of 2010**, enacted under the **Environment Protection Act of 1986**, make it **compulsory** for the **state government** to **identify, demarcate and officially designate all wetlands across the state within a stipulated period of two years**.
- Due to various **anthropogenic threats**, including **high loads of pollutants from agricultural runoff, industrial waste and sewage**, **native species of wetlands** are being replaced by **invasive species**.
- **Invasive species** can outcompete native plants and animals within wetlands. This can lead to a disturbance in the ecosystem, ultimately diminishing the overall health of the wetland.

What is a Wetland?

- A wetland is a **piece of land** that serves as a **transition** between **terrestrial and aquatic ecosystems**, typically with a **water table** that is at or near the surface or on the surface of shallow water.
- It supplies a **diverse range of ecosystem services**, including **aquifer recharge, water storage, water purification, flood mitigation, and erosion control**.

- **Wetlands** provide **habitat to a variety of native species of plants and animals** as well as thousands of **winter migratory birds**.
- They **prevent settlements** from getting flooded by **absorbing excess rainwater** and then releasing it slowly during **dry seasons** or droughts. They also help **sequester carbon**, which helps mitigate climate change.

Wetlands (Conservation and Management) Rules of 2017: Salient features

- It specifies that a **State Wetland Authority (SWA)** be established in **each state and union territory**, to be led by the **state's environment minister**.
- A variety of government representatives will be present. **Hydrology, socioeconomics, landscape design, fisheries, and wetland ecology** each had one specialist.
- They will choose the **“smart use principle”** that will control how wetlands are managed.
- The principles of sustainable use that are acceptable to conservation are referred to as **“wise use.”** Powers have been decentralised as a result of this.
- The **SWA** must compile a thorough list of the activities that must be governed and approved in the notified wetlands and their zone of influence.
- Add further activities that should be forbidden in some wetlands.

Develop plans for a more effective use of wetlands.

- Recommend actions to protect wetlands and to increase local communities' and stakeholders' knowledge of the significance of wetlands.
- The **Central Wetlands Regulatory Authority** will be replaced by the **National Wetland Committee (NWC)**, which will be led by the **MoEFCC secretary**.
- The rules forbid activities like **encroachment of any kind**, the establishment and growth of industries, waste disposal, and the discharge of untreated wastes and effluents from businesses, cities, towns, villages, and other human settlements.
- State authorities are required to compile a list of all wetlands and a list of wetlands that need to be informed within **six months**.
- It will serve as the foundation for the creation of an exhaustive digital inventory of all wetlands, which will be updated **every 10 years**.

Drawbacks of the 2017 rules:

- **River channels, paddy fields, man-made water bodies/tanks** specifically constructed for drinking water purposes, and structures specifically constructed for **aquaculture, salt production, recreation, and irrigation purposes** are **not** included in the **2017 rules'** definition of wetland.

- According to this **new definition** (excluding the aforementioned wetlands), nearly **65 per cent of the country's wetlands will lose their status**.
- Because they are **not considered wetlands**, the management and protection granted to river channels and man-made wetlands will be ineffective.
- **Wetlands** are defined and included by the **respective state or territory**. This may result in a **lack of consistency** in defining and **conserving the country's wetlands**.
- In the **2017 Rules**, the older provision of appealing to the **National Green Tribunal** no longer exists.
- There is also **no timetable for eliminating** the dumped of **solid waste and untreated waste into wetlands**.
- The new rules do not take into account the **Supreme Court's decision in Jagpal Singh vs. State of Punjab (2011)** for the restoration of encroached wetlands across the country.
- Understanding multiple-use regimes is important for wetland conservation, but so is preserving and managing the wetland ecosystem's integrity.

Topic 21. RISING TIDES, ROOTED SOLUTIONS

Important for the subject: Environment

Mangroves:

Mangroves, with their **unique ability to thrive in brackish waters** where the **sea meets freshwater**, form a **crucial barrier** between **land and sea**, hosting a **rich biodiversity** and providing **vital ecosystem services**.

- These **trees and shrubs** (found in **tropical and subtropical regions**) are **adapted to live in the intertidal zone** with **complex root systems** that **stabilize soil** and **cope with varying salinity levels**, making them some of the most productive wetlands.
- Despite their importance, **mangroves** face threats from **habitat loss**, **climate change**, and **anthropogenic activities**.

Mangroves in India:

- According to the **Indian State Forest Report 2021**, the **Mangrove cover in India** is **4992 sq. Km** which is **0.15% of the country's total geographical area**.
- **Sundarbans** in **West Bengal** are the **largest mangrove forest regions** in the **world**. It is listed as a **UNESCO World Heritage Site**.
- Besides the **Sundarbans**, the **Andamans region**, the **Kachchh** and **Jamnagar areas** in **Gujarat** too have substantial mangrove cover.

- The country's mangrove ecosystems are categorized into **Deltaic mangroves** on the **east coast**, influenced by **large river deltas**, and **Non-Deltaic and Island mangroves** on the **west coast and islands**, respectively.
- The **east coast** has more **extensive mangrove areas** due to **broader river deltas** like the **Ganga and Brahmaputra**, contributing to **richer mangrove biodiversity** in comparison to the **narrower estuaries** of the **west coast**.
- **India** stands out globally for its mangrove species richness, hosting over **4107 species**, including **925 plant** and **3182 animal species**, underscoring the critical need for conservation efforts to protect these vital ecosystems from ongoing threats.

International Day for the Conservation of the Mangrove Ecosystem:

- It is **celebrated every year** on **26 July** and **aims to raise awareness of the importance of mangrove ecosystems** as “**a unique, special and vulnerable ecosystem**” and to promote solutions for their sustainable management, conservation and uses.
- This **International Day** was adopted by the **General Conference of the UN Educational, Scientific and Cultural Organization (UNESCO)** in **2015**.

How do mangroves impact human well-being?

- **Mangroves** play a crucial role in supporting **food security and livelihoods for communities** through the **aquaculture industry**, acting as **nurseries for fish species** vital for global fisheries.
- They provide a **range of food products** and have significant **medicinal and economic value**.
- Beyond their role in supporting **biodiversity** and **local economies**, **mangroves** act as a **natural barrier against extreme weather events**, **reducing wave height** and **protecting coastal regions** from **cyclones** and **tsunamis**, thus earning the title of a ‘**bio shield**’.
- Their effectiveness in **mitigating natural disasters** has been underscored by instances like the **2004 Indian Ocean Tsunami** and **Cyclone Gaja in 2018**, where **mangroves** significantly **reduced damage and saved lives**.
- The **importance of mangroves in coastal protection** is **increasingly recognized**, especially in the **context of climate change** and its associated impacts.
- However, the **protective capacity of mangroves** depends on factors such as the **age and density of the forest**, highlighting the **need for conservation and restoration efforts** to **maintain and enhance these vital ecosystems**.

Coastal metropolises are losing their mangroves:

- **Indian metropolises** like **Mumbai, Chennai, and Kolkata**, located along the **country's extensive coastline**, are **highly vulnerable to climate change-induced hazards** such as **sea level rise, coastal erosion, flooding, and storm surges**.

Government Initiatives Related to Mangrove Conservation:

- **MISHTI** (Mangrove Initiative for Shoreline Habitats & Tangible Incomes)
- **Sustainable Aquaculture In Mangrove Ecosystem (SAIME)** initiative

Topic 22. DUSTED APOLLO

Important for the subject: Environment



Apollo Butterfly

In the news:

The **Dusted Apollo (Parnassius stenosemus)**, a **rare high-altitude butterfly**, was recently **sighted and photographed for the first time** in **Himachal Pradesh**, specifically during a trek to **Manimahesh Lake** in **Chamba**.

- This sighting is significant for the diversity of **Apollo butterflies** in the region, emphasizing its **flourishing state**.
- **Discovered in 1890**, the **Dusted Apollo's** range spans from **Ladakh** to **West Nepal**, inhabiting **altitudes** between **3,500 to 4,800 meters** in the **inner Himalayas**.
- This species, **never before photographed in Himachal Pradesh**, is **distinguished** from the **Ladakh Banded Apollo** by **specific features** like a **complete discal band** on the **upper forewing** and a **narrower dark marginal band** on the **hind wings**.
- The **identification** of the **Dusted Apollo** was confirmed after **thorough scientific examinations**.

- Additionally, the sighting of another rare species, the **Regal Apollo** (*Parnasius charltonius*), was noted, which is protected under **Schedule II** of the **Wildlife Protection Act, 1972**.
- These sightings are an **indicator of the region's rich butterfly diversity** and there is a need for **immediate conservation efforts** due to the **endangered status of Apollo butterflies**, which are also targeted by poaching.

Topic 23. BLACK NECKED CRANE

Important for the subject: Environment



The **Wildlife Institute of India** and the **Zoological Survey of India** have been carrying out assessments of the black-necked cranes.

As per the survey conducted by **Wildlife Institute of India in 2016-2017 in Ladakh region**, the population size of black necked cranes was around 66-69 individuals.

In Arunachal Pradesh, a **small population of approximately 11 individuals** arrives during winter months.

Conservation status of the species:

- The **Black-necked Crane** (*Grus nigricollis*) is listed in **Schedule I** of the **Wild Life (Protection) Act, 1972**, thereby according them the highest degree of protection.
- The species is also listed in **Appendix I** of **Convention on International Trade in Endangered Species of wild fauna and flora** and the **Convention on conservation of Migratory Species**.
- The black-necked crane is evaluated as **near threatened** on the **IUCN Red List of Threatened Species**.

Habitat Areas of Black necked Crane:

- **High altitude marshes and lakes of Tibetan Plateau** (Tibet, Qinghai, Xinjiang, Gansu),

- **Sichuan (China), and Eastern Ladakh (India)** are the known breeding grounds of black-necked cranes.
- The major wintering flocks are in **Tibet, Yunnan and Guizhou (China) and Bhutan (Phobjika and Bomdaling Valleys)**.

Important steps taken to protect the species:

- The important habitats of **Black-necked Crane** have been notified as **Protected Areas, for example, Changthang Sanctuary, Ladakh.**
- The **Tso Kar Wetlands Complex, an important foraging and breeding ground for Black-necked Crane**, has been designated as a Ramsar Site in December 2020.
- The **National Wildlife Action Plan (2017-2031)** released by the Ministry in **October 2017** provides for specific Chapters and priority actions on various aspects of wildlife conservation like, conservation of threatened species, mitigating human wildlife conflict, conservation of inland and coastal and marine ecosystems, landscape level conservation, etc.
- The **Central Government** provides financial assistance to **State/Union Territory Governments under the Centrally Sponsored Schemes ‘Development of Wildlife Habitats’** for management of wildlife and its habitat in the country.
- In accordance with provisions contained under **Section 33 of the Wild Life (Protection) Act, 1972**, the Ministry has issued guidelines for the process of management planning for Protected Areas.
- The Government of India has initiated **Mission LiFE (Lifestyle for Environment) programme, that aims to generate public awareness about the environment, and conservation.**
- Important days such as **World Wildlife Day, Wetlands Day, Migratory Bird Day, etc. and Wildlife Week** are celebrated to bring in more awareness on wildlife and biodiversity among the public.

Topic 24. SCHEMES FOR RESTORATION OF MANGROVE FORESTS

Important for the subject: Environment



Union Minister of State for Environment, Forest and Climate Change Shri Ashwini Kumar Choubey in a written reply in the Lok Sabha, **told about various schemes for conservation of mangrove forests.**

About Mangroves:

- **Mangroves are the plant communities occurring in inter-tidal zones** along the coasts of tropical and subtropical countries.
- Mangrove forests perform multiple ecological functions such as **production of woody trees; provision of habitat, food, and spawning grounds for fin-fish and shellfish; provision of habitat for birds and other valuable fauna; protection of coastlines and accretion of sediment to form new land.**
- Mangrove plants have several unique adaptations that allow them to survive in harsh environments. Mangroves are extremely important to the coastal ecosystems they inhabit.

Mangrove Forests trees project different types of roots:

- **Prop** – They are down into the water
- **Air** – They are vertically configured up from the mud
- **Stilt** – These roots emerge from the main trunk of the tree; also called adventitious roots.

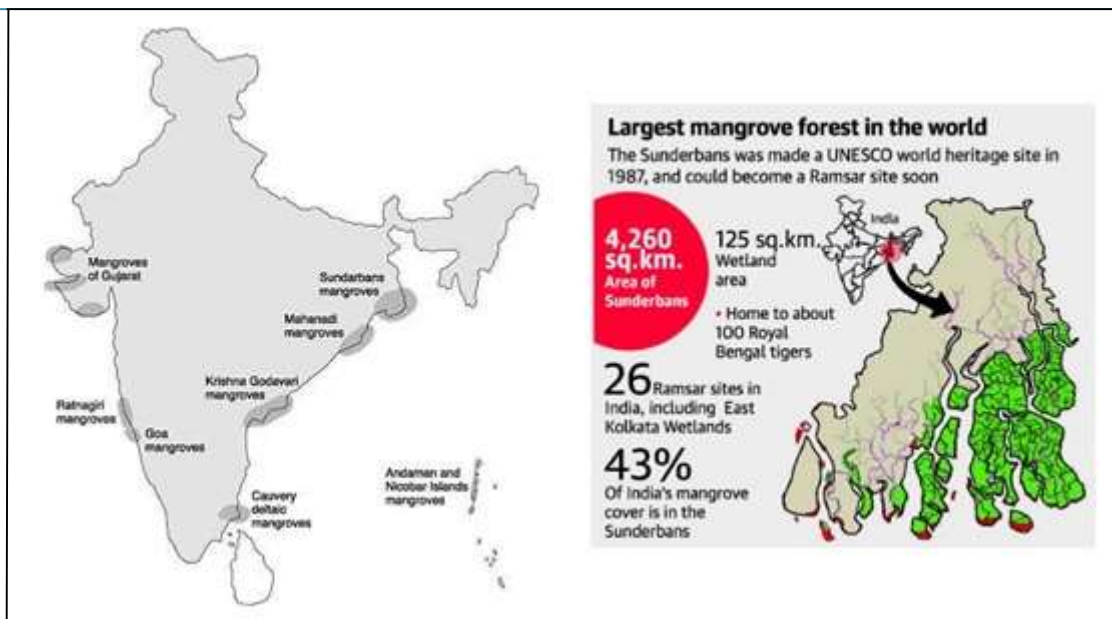
There are three important types of mangroves:

- **Red mangroves:** They grow along coastlines and are the hardiest of the three major mangrove plant types.

- **Black mangroves:** They are named so because of their dark bark. They usually grow at slightly higher elevations than red mangroves. They have access to more oxygen because the roots are more exposed.
- **White mangroves:** They grow at higher elevations than red and black mangroves. Generally they do not have aerial roots.
- But sometimes there is unique growth of peg roots when oxygen is depleted due to flooding.
- **The promotional measures are being implemented through a Central Sector Scheme namely 'Conservation and Management of Mangroves and Coral Reefs' under National Coastal Mission Programme of the Ministry of Environment, Forest & Climate Change.**

Presence of Mangroves:

- About **40% of the world's mangrove cover is found in South East Asia and South Asia. India has about 3% of the total Mangrove cover in South Asia.**
- Mangrove cover in the country has increased by **54 sq km (1.10%) as compared to the previous assessment.**
- The current assessment shows that mangrove cover in the country is **4,975 sq km [(1.2 million acres)], which is 0.15% of the country's total geographical area.**
- **West Bengal has 42.45% of India's mangrove cover, followed by Gujarat 23.66% and A&N Islands 12.39%.**
- **Gujarat** shows a maximum increase of 37 sq km in mangrove cover [(over 9,000 acres).
- **South 24 Parganas district of West Bengal** alone accounts for 41.85% mangrove cover of the country.
- **South 24 Parganas holds the Sunderban National Park**, home to one of the largest mangrove forests in the world.



Schemes for conservation of Mangroves:

- **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)**
- **Union Budget 2023-24** announced ‘Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)’ to promote and conserve mangroves as a unique, natural ecosystem having very high biological productivity and carbon sequestration potential, besides working as a bio shield.
- **MISHTI** was launched by the **Ministry of Environment, Forest & Climate Change** on the occasion of **World Environment Day** i.e., **5th June 2023**.
- **MISHTI** envisages restoration/reforestation of Mangroves covering approximately **540 km²**, spreading across 9 States and 3 Union Territories for a period of five years commencing 2023-24 onwards.
- The States have also been encouraged to take activities under **MISHTI** through convergence with the existing schemes/programs.
- Overall, the mangrove cover of the country witnessed an increase of **252 km²** between **2015 to 2021**.

Mangrove Alliance for Climate (MAC):

- The UAE and Indonesia launched the “**Mangrove Alliance for Climate**” on the sidelines of the **UN climate summit COP27**, being held in **Sharm El Sheikh** in **Egypt**.

- As part of this alliance, an international mangrove research center will be established in Indonesia which will conduct studies on mangrove ecosystem services such as carbon sequestration and ecotourism.

Partners:

- Spearheaded by the **United Arab Emirates (UAE)** in partnership with **Indonesia, India, Australia, Japan, Spain and Sri Lanka have joined it as partners.**

Topic 25. AIR QUALITY GRANT TO MILLION PLUS CITIES***Important for the subject: Environment***

Union Minister of State for Environment, Forest and Climate Change Shri Ashwini Kumar Choubey in a written reply in the Lok Sabha gave the details of funds utilized under the Air Quality Grant sanctioned by 15th Finance Commission.

- Under the 15th Finance Commission air quality performance grant, an amount of Rs. 16539 crores has been allocated to 42 Million Plus Cities (MPCs) **(including 7 Urban Agglomerations (UAs)) during FY 2020-21 to FY 2025-26 to implement city action plans to take measures to improve air quality.**

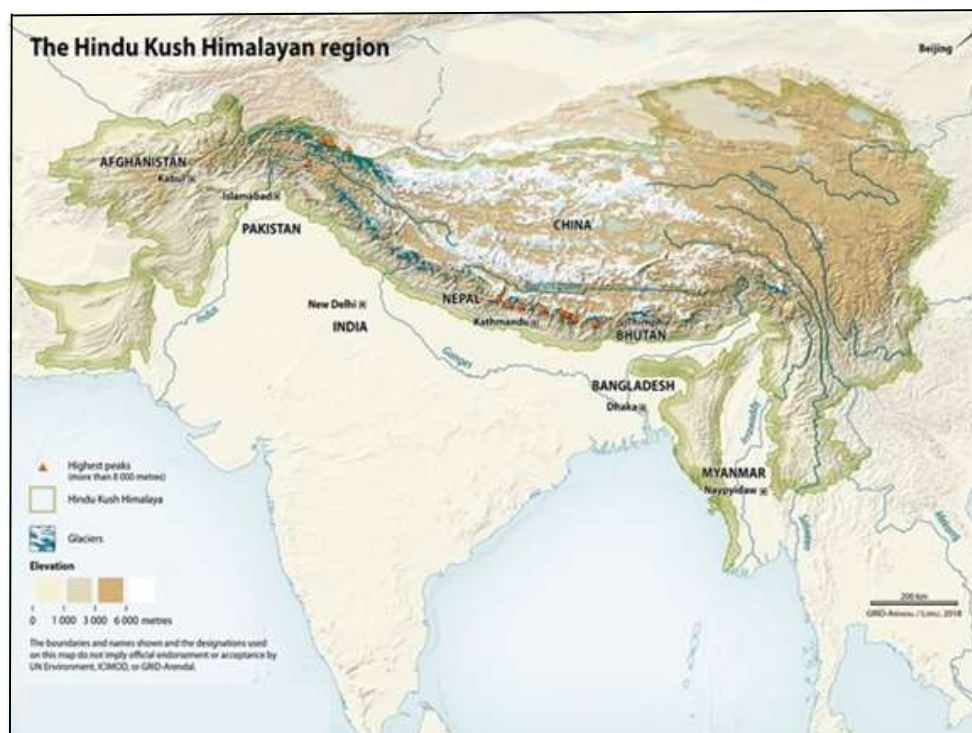
About funds:

- The details of funds utilized under the Air Quality Grant sanctioned by **15th Finance Commission to Million Plus Cities/ Urban Agglomeration as aimed by the National Clean Air Program (NCAP)** for performance-based grants for improvement in air quality for the period **2020-21 to 2025-26, city-wise.**
- The details of funds utilized under the **15th Finance Commission to support the implementation of City Specific Action Plans (CAPs)** for improvement of Air Quality under the National Clean Air Programme along with the details for non-utilization of funds by non-attainment cities.
- The details of mobilization of City Specific Action Plans through the convergence of resources for
- **Swachh Bharat Mission (Urban), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart City Mission.**
- **Sustainable Alternative Towards Affordable Transportation (SATAT),**
- **Faster Adoption and Manufacturing of Hybrid and Electric Vehicle – II (FAME), and other schemes.**
- **131 cities under NCAP have been requested to mobilize resources** through convergence of various schemes for the implementation of city action plans.

- Action plans of all targeted cities under NCAP were approved under Swachh Bharat Mission 2.0 (Urban) for processing of solid waste, construction and demolition waste, remediation of legacy waste and procurement of mechanical sweepers.
- 107 cities have availed resources from the AMRUT 2.0 for developing green spaces, parks and non-motorised urban transport.
- 13,11,681 number of electric vehicles have claimed the benefit under FAME II in 20 States/UTs.

Topic 26. HINDU KUSH HIMALAYA IS A 'BIOSPHERE ON THE BRINK': ICIMOD

Important for the subject: Environment



Experts from The International Centre for Integrated Mountain Development (ICIMOD) have urgently called for significant actions and immediate funding to prevent the **deterioration of nature** in **High Mountain Asia**, during a meeting on February 5, 2024, in **Kathmandu, Nepal**.

- Highlighting the critical state of the **Hindu Kush Himalaya (HKH) region**, known for its **rich biodiversity**, ICIMOD warned that this area is on the **verge of ecological collapse** as global experts gather for the **Third Lead Authors meeting** of the **IPBES nexus assessment**.
- This meeting, hosted by **ICIMOD**, focuses on **understanding the connections between food, water security, health, biodiversity, and climate change**.

- The dire situation in the **HKH** is described as **catastrophic** due to **rapid losses in nature and habitat**.
- The **region**, home to **four** of the world's **36 biodiversity hotspots**, significant **eco-regions**, **protected areas**, and **bird habitats**, has seen a **70% loss** in its **original biodiversity** over the last century.
- Despite this, the **local mountain communities**, which are highly dependent on this **biodiversity for sustenance, water, flood control**, and **cultural identity**, are facing an accelerating crisis.

Biodiversity of HKH region:

- The mountain ecosystems of the **Hindu Kush Himalaya (HKH)** are diverse with one of the **highest diversity of flora and fauna** providing varied ecosystem services to one fourth of humanity.
- With **four out of 36 global biodiversity hotspots** the **HKH** is a cradle for **35,000+ species of plants** and **200+ species of animals**.
- At least **353 new species**—**242 plants**, **16 amphibians**, **16 reptiles**, **14 fish**, **two birds**, and **two mammals**, and **at least 61 invertebrates**—have been discovered in the Eastern Himalayas between 1998 and 2008, equating to an **average of 35 new species finds every year**.
- The **Hindu Kush Himalaya (HKH) region** is of global importance due to its unique biodiversity and is home to **4 of 34 global biodiversity hotspots**, **6 UNESCO natural World Heritage sites**, **30 Ramsar sites**, **330 Important Bird Areas (IBAs)** and **53 Important Plant Areas (IPAs)**.
- In total, there are **60 ecoregion types (6 per cent of the world total)**, of which **30** are critical ecoregions.
- HKH countries have established roughly **488 protected areas** in the region with varying degrees of protection and status, covering **39 per cent of HKH terrestrial land**.

Significance of Hindukush- Himalaya region (HKH):

- The biodiversity of the region — **40 per cent of which is under protected areas** — is dependent on the **cryosphere** as it is an important source of water for maintaining ecosystem health, supporting biological diversity, and providing ecosystem services.
- Glaciers occupy an area of approximately **73,173 square kilometres (km²)** in the HKH.
- The average temperature in the region has increased by **0.28°C per decade** between **1951 and 2020**.
- The HKH region harbours the **highest mountain ranges in the world**. It also contains the **largest volume of ice on earth outside of the polar areas** and is called “**Asia’s water tower**”.

- The region is undergoing “**unprecedented and largely irreversible**” changes triggered by global warming.
- Ice and snow in the Hindu Kush Himalaya are an important source of water for **12 rivers** that flow through **16 countries in Asia**, providing fresh water and other vital ecosystem services to **240 million people** in the mountains and a further **1.65 billion** downstream.

Water tower:

- **High Mountain Asia** comprises of **mountain ranges** such as the **Tian Shan, Kunlun Shan, Pamir, Karakoram, Hindu Kush, Tibetan Plateau** and the **Himalayas**.
- **HKH**, which stretches **3,500 kilometres** and spans **eight countries**, is home to most of the **snow and ice on Earth outside the poles**. At least **12 rivers** fan out in every direction across the Asian continent from it:
- Syr Darya and Amu Darya towards the now-dead Aral Sea
- The Tarim toward the Taklamakan
- The Indus, Ganga and Brahmaputra towards the Arabian Sea and Bay of Bengal
- The Yellow River towards the Gulf of Bohai
- The Yangtze towards the East China Sea
- The Mekong towards the South China Sea
- The Chindwin, Salween and Irrawaddy towards the Andaman Sea
- The ‘**Water Tower of Asia**’ provides **essential ecosystem services** such as clean water for a third of the world’s population.
- It is estimated to be warming at nearly two times the average rate of warming in the Northern Hemisphere.
- **Nexus Assessment: Thematic assessment of the interlinkages among biodiversity, water, food and health.**
- The **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Plenary**, at **IPBES 7 (2019, Paris)**, adopted a **new work programme** following up on the **first IPBES work programme 2014-2018**.
- This **new work programme** includes a **thematic assessment** of the **interlinkages among biodiversity, water, food and health** (nexus assessment), which will examine the interlinkages among the **sustainable development goals** related to **food and water security, health for all, protecting biodiversity on land** and in the **oceans and combating climate change**.

About ICIMOD:

Founded in 5 December 1983.

- The **International Centre for Integrated Mountain Development (ICIMOD)** is an **intergovernmental knowledge and learning centre** working on behalf of the people of the **Hindu Kush Himalaya (HKH)**.
- We are based in **Kathmandu, Nepal** and work in and for our **eight regional member countries** – **Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.**
- They work to **improve the lives and livelihoods of men, women, and children of the HKH** and **protect mountain environments and cultures.**

Activities:

- Their activities range greatly from **hands-on research and piloting of solutions, to policy implementation with governments, to mountain advocacy on the global stage.**

Topic 27. NEW GRI BIODIVERSITY STANDARD DEMANDS REPORTING OF DRIVERS OF BIODIVERSITY LOSS, IMPACT ON INDIGENOUS PEOPLES

Important for the subject: Environment

The **Global Reporting Initiative (GRI)** has **launched** an updated **Biodiversity Standard, GRI 101: Biodiversity 2024**, aimed at enhancing **global transparency** in reporting **biodiversity impacts**.

- **Developed** by the **Global Sustainability Standards Board (GSSB)**, this standard is designed to help **businesses, governments, and other organizations** report on their **environmental impact**, including issues related to **climate change, human rights, and corruption.**
- The **new standard** focuses on providing a **detailed account of an organization's impact on biodiversity** through its **supply chain and operations**, addressing the urgent need to **mitigate the pressures on nature**, with over **one million plant and animal species at risk of extinction.**
- Scheduled for **formal implementation from January 1, 2026**, the document is currently available for **early adoption and pilot testing.**
- It is aligned with **critical global biodiversity developments**, such as the **United Nations Kunming-Montreal Global Biodiversity Framework**, the **Science-Based Target Network**, and the **Taskforce on Nature-Related Financial Disclosures.**
- The standard **aims** to meet the **increasing demands for information on biodiversity impacts** from various stakeholders, offering full transparency throughout the supply chain and requiring disclosure of location-specific impacts, direct drivers of biodiversity loss, and effects on communities and Indigenous Peoples.

- The updated standard will help in **raising transparency** and **understanding the risks and dependencies** associated with **biodiversity loss**.

The Science Based Target Network (STN):

- It aims to transform economic systems and protect the global commons – our air, water, land, biodiversity and ocean.
- **Vision:** A global economy in which companies and cities operate within environmental boundaries on a socially equitable basis through the setting of science-based targets (SBTs) to transform their impact.

Mission:

- Develop methods for cities and companies to set integrated targets across all Earth systems.
- Build on the progress of establishing science-based targets for climate to achieve widespread adoption of science-based targets on water, land, biodiversity and ocean.
- Demonstrate significant progress in line with key global policy milestones like the SDGs, and goals and targets under the UNFCCC, UNCCD, CBD, by developing an indicator framework that tracks how SBT setters deliver progress.
- Work to embed adoption of science-based targets within capital markets by partnering with policy makers, financial institutions and service providers such as benchmarkers and credit agencies.

About Global Reporting Initiative (GRI):

- **Founded:** 1997, Boston, Massachusetts, **United States**
- **Founders:** United Nations Environment Programme, Ceres, Tellus Institute
- **GRI** is the **independent, international organization** that helps businesses and other organizations take responsibility for their impacts, by providing them with the **global common language to communicate those impacts**.
- The **GRI Secretariat** is **headquartered** in **Amsterdam, the Netherlands**, and they have a **network of seven regional offices** to ensure we support organizations and stakeholders worldwide.

Topic 28. CAMEROON ADOPTS NAGOYA PROTOCOL TO BENEFIT FROM ITS RICH BIODIVERSITY

Important for the subject: Environment



Cameroon, a country rich in biodiversity in Central Africa, has adopted the Nagoya Protocol on Access and Benefit Sharing.

About Nagoya Protocol:

- The **Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation (ABS)** to the **Convention on Biological Diversity** is a supplementary agreement to the **Convention on Biological Diversity**.
- It provides a **transparent legal framework** for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilisation of genetic resources.
- The **Nagoya Protocol on ABS** was adopted on **29 October 2010** in **Nagoya, Japan** and entered into force on **12 October 2014**, 90 days after the deposit of the fiftieth instrument of ratification.
- Its objective is the **fair and equitable sharing of benefits arising from the utilization of genetic resources**, thereby contributing to the conservation and sustainable use of biodiversity.

Exploitation of biological resources of Cameroon:

- The **protocol** is a response to the **exploitation** of **Cameroon's** estimated **11,000 species** of **plants, animals, and microorganisms**, which include **valuable genetic resources and traditional knowledge** used for **bioprospecting** – the search for new sources of **drugs, food, and other products**.
- One highlighted issue is the exploitation of **Prunus Africana**, a **plant endemic to Cameroon** used in **prostate cancer drugs**.
- Foreign companies have been buying this **resource** at **low prices** and **selling the finished drugs** at a **high markup without benefiting the local communities**.
- The **adoption** of the **Nagoya Protocol** aims to change this dynamic by **protecting the rights and interests of indigenous and local communities** and **promoting biodiversity-based innovation**.

Solution:

- **Cameroon** has enacted **legislation** to implement the **Nagoya Protocol** but faces challenges such as **lack of tools, institutional capacity, and research and development on the biodiversity value chain**.
- To overcome these challenges, the **Global Environment Facility** has financed a project to support **bioprospecting** research in **Cameroon**.
- The project focuses on **several species**, including the **bush mango (Irvingiawombulu)**, known for its **medical properties** and **economic potential**.
- **Cameroon** has also signed **agreements** with **French and Swiss cosmetic businesses** for **research, development, and**
- **commercial activities** based on the **Nagoya Protocol**, illustrating a move towards better leveraging the country's biological resources for economic development and ensuring that exploitation is aligned with the protocol's guidelines for fair and equitable benefit sharing.

Topic 29. NATIONAL CREDIT FRAMEWORK

Important for the subject: Schemes

The Central Board of Secondary Education (CBSE) has proposed significant changes to the academic framework for secondary and higher secondary education

- Changes include shift from studying two languages to three in Class 10, with the requirement that at least two must be native Indian languages.
- Students in Class 10 may now need to pass in 10 Important for the subjects, as opposed to the current requirement of five.
- The proposed changes for class 12 involved students studying two languages instead of one, with the condition that at least one must be a native Indian language.

- The proposed changes form part of the CBSE's broader initiative to implement a national credit framework in school education.
- Creditisation aims to establish academic equivalence between vocational and general education, facilitating mobility between the two education systems, as proposed by the National Education Policy 2020.

About Notional learning:

- Notional learning refers to a stipulated amount of time that an average student would need to spend in order to attain the specified outcomes.
- Each Important for the subject has been allotted a certain number of hours so that, in a year, a student spends a total of 1200 learning hours to be declared pass.
- The hours will include both academic learning at school and non-academic or experiential learning outside the school.

About Credit System:

- The credits earned by a student will be digitally stored in the Academic Bank of Credits and accessible through a linked Digilocker account.
- The credits will be "independent" of the marks obtained by a student.

About National Credit Framework (NCrF):

- The National Credit Framework (NCrF) is based on the recommendation of an inter-ministerial committee led by Nirmaljeet Singh Kalsi
- NCrF is about giving credit for each and every activity a student does in one's lifetime as a student.
- Many sports, vocational training, science projects, art and craft activities and other such things will get credits.
- NCrF aims to bring all school students under a unified credit system.

Topic 30. PFRDA INVITES BIDS FOR SYSTEM INTEGRATOR FOR PFRDA – TRACE***Important for the subject: Schemes***

The Pension Fund Regulatory and Development Authority (PFRDA) has **invited bids for the purpose of selection of a System Integrator (SI) for the design, development, implementation, and maintenance of PFRDA – TRACE.**

- **Project Name:** PFRDATRACE (Tracking Reporting Analytics & Compliance EPlatform).

Scope: The SI will play a crucial role in designing, developing, and maintaining the platform.

- This initiative reflects **PFRDA's commitment to leveraging technology for effective tracking, reporting, analytics, and compliance in the management of pension funds.**
- PFRDA-TRACE is part of the **Technology Architecture (TARCH) project and will serve as a comprehensive tool for submitting regulatory and supervisory compliance reports by intermediaries.**
- PFRDA-TRACE aims to **facilitate the submission of regulatory and supervisory compliance reports by intermediaries, share reports and data with PFRDA, monitor functions, enable workflow for PFRDA departments, and incorporate a validation process for reports and data.**
- The selected System Integrator (SI) will be **responsible for studying existing processes, proposing improved workflows, and providing services for the design, development, customization, implementation, and maintenance of PFRDA-TRACE.**
- PFRDA-TRACE represents the second phase of the TARCH project, **indicating a strategic step in enhancing digital capabilities and regulatory oversight in the pension fund sector.**

PFRDA (Pension Fund Regulatory and Development Authority):

Overview:

- PFRDA is the regulatory body overseeing the pension sector in India – National Pension System (NPS) and Atal Pension Yojana (APY).
- It was established by the Government of India to promote old-age income security.
- Implementing measures to enhance pension coverage and efficiency.

Functions:

- **Regulation:** Formulating policies and regulating pension funds.
- **Promotion:** Promoting the development of the pension industry.
- **Protection:** Safeguarding the interests of pension subscribers.

NPS (National Pension System):

Introduction:

- NPS is a voluntary, long-term retirement savings scheme designed to enable systematic savings.
- Launched by the Government of India.

Key Features:

- **Contributors:** Open to all citizens, including employees from the organized and unorganized sectors.
- **Flexible Contributions:** Allows individuals to contribute regularly and build a pension corpus.
- **Investment Options:** Offers a range of investment choices for subscribers.
- **Portability:** Portable across jobs and locations.
- **Tax Benefits:** Provides tax benefits under specific sections of the Income Tax Act.

Structure:

- NPS is structured into Tier I and Tier II accounts.
- Tier I is a long-term retirement account.
- Tier II is a voluntary savings account with liquidity features.

APY (Atal Pension Yojana):**Objective:**

- APY aims to provide a sustainable pension to unorganized sector workers.
- Specifically targets individuals between the age of 18- 40 years, without access to formal pension schemes.

Eligibility:

- Open to Indian citizens aged between 18 and 40 years.

Features:

- **Fixed Pension:** Offers a fixed pension amount based on contribution and age.
- **Contributions:** Contributions vary based on the chosen pension amount and age at entry.
- **Government Co-Contribution:** The government provides co-contribution for eligible subscribers.
- **Guarantee:** Guarantees pension benefits to the spouse in case of the subscriber's demise.

Structure:

- The scheme is administered by the PFRDA.
- It focuses on ensuring a steady income stream for individuals in the unorganized sector during their old age.

Topic 31. HIMALAYAN TREELINES MIGHT BE CLIMBING HIGHER IN RESPONSE TO CLIMATE CHANGE

Important for the subject: Schemes

Alpine treelines in the Himalayas and Hengduan regions are ascending towards mountaintops in response to climate change.

- The **treeline**, marking the **highest altitude** where **trees grow**, forms a **transition** from **forests** to **treeless alpine vegetation**.
- This **environment**, typically **harsh** and characterized by **low temperatures**, is **sensitive to climate changes**.
- Recent studies reveal that these **treelines** are **affected by temperature and moisture**, with **varying impacts across different species**.
- For example, in the **Himalayas**, **treelines** are **primarily moisture-sensitive**, while in the **Hengduan region**, they are affected by both **temperature** and **moisture**.
- The study also reports **differences in seedling recruitment and treeline shifting rates** between **Nepal** and the **Hengduan Mountains**.
- The **Hengduan Mountains** are a group of mountain ranges in **southwest China** that **connect the southeast portions of the Tibetan Plateau** with the **Yunnan–Guizhou Plateau**.
- The **Hengduan Mountains** are **primarily large north-south mountain ranges** that effectively **separate lowlands in northern Myanmar** from the **lowlands of the Sichuan Basin**.
- Global studies show that **mountain treelines** are generally rising, with the rate of ascent accelerating, especially in **tropical regions**.
- This phenomenon underlines the importance of factors like **precipitation** and **temperature** in **determining treeline distribution and dynamics**.

Alpine Forests:

- Altitudes ranging between **2,900 to 3,500**.
- These forests can be divided into: (1) sub-alpine; (2) moist alpine scrub and (3) dry alpine scrub. The **sub-alpine forests** occur **lower alpine scrub and grasslands**.
- It is a **mixture of coniferous and broad-leaved trees** in which the **coniferous trees attain a height of about 30 m** while the **broad leaved trees reach only 10 m**.
- **Fir, spruce, rhododendron**, etc. are important species.
- The **moist alpine scrub** is a **low evergreen dense growth of rhododendron, birch** etc. which occurs from **3,000 metres** and extends upto snowline.

- The **dry alpine scrub** is the **uppermost limit** of **scrub xerophytic, dwarf shrubs**, over **3,500 metres** above **sea level** and found in **dry zone**. **Juniper, honeysuckle, artemesia** etc. are important species.

Understanding treeline dynamics:

- **Dendrochronology**, the **study of tree rings**, plays a **vital role** in understanding **historical mountain ecosystems**.
- It helps determine the **age of trees** and analyze the **relationship** between **climate factors** and **tree growth**.
- This method reveals whether a **treeline** is **static or shifting**; **older trees** at the upper boundary suggest a **static treeline**, while **younger trees** at higher elevations indicate a **moving treeline**.
- The **correlation** of **annual tree ring widths** with **climatic data** from nearby stations enables researchers to identify **limiting climatic factors for tree growth**, such as **low rainfall leading to smaller rings**.
- However, **treeline shifts** are **not solely due to climate change**. **Microbes, fungi, and symbiotes** are **crucial** in supporting **alpine tree growth**, impacting **hydrogen acquisition and seed growth**.
- The **shift in treelines** raises concerns about the **availability of these biotic conditions**.
- Understanding **treelines**, particularly in the **Himalayas**, requires **long-term studies from permanent plots** to identify the **key driving factors**.

Consequences:

- The **upward movement of treelines** in the **Himalayas**, driven by **climate change**, significantly **impacts the region's mountain ecosystems**.
- This **shift** can **lead to habitat displacement and loss**, affecting plant and animal species adapted to specific elevations and potentially **causing local extinctions**.
- The changing landscape **disrupts the intricate relationships between flora and fauna, altering biodiversity patterns**, with some species thriving and others declining.
- **Non-vascular plants** like **bryophytes and lichens**, which exist beyond the treeline, face **increased competition** from **advancing sub-alpine forest trees** for resources like light.
- This **upward movement of trees** also **alters soil properties**, such as **nutrient content and moisture**, impacting **understorey plant communities**.
- Additionally, the **growth of sub-alpine forests** in previously treeless areas can significantly affect **hydrology**, potentially reducing stream flow and runoff downstream, particularly in areas where water is already scarce.

Conservation measures:

- Understanding the **shifting alpine treelines** in the **Himalayas** requires addressing the research gap in **treeline dynamics**, particularly using **precise** and **updated data** like **remote sensing** rather than **outdated toposheets**.
- Experts emphasize a **comprehensive conservation approach**, involving **habitat preservation**, **reforestation**, **effective water management**, **community engagement**, and **policy support**.
- **Continuous research, monitoring, and international collaboration** are essential for understanding and managing the **shifts in treeline and ecosystem dynamics**.
- Additionally, **generating and monitoring baseline data on plant species populations** is crucial, considering treelines as part of a broader ecological context, including adjacent eco-regions.

Topic 32. CTE AWAITS MINISTRY NOD TO ROLL OUT NATIONAL MISSION FOR MENTORING***Important for the subject: Schemes***

With an aim to provide mentoring to school teachers, the National Council of Teacher Education (NCTE) has proposed to expand its pool of mentor teachers from 60 to 1,000 and is awaiting the nod of Ministry of Education to approve the National Mission for Mentoring (NMM), so that the mission can be rolled out across the country.

About National Mission For Mentoring

- National Mission for Mentoring (NMM) is a **programme in line with the National Education Policy (NEP) 2020**.
- which offers professional development **opportunities to Mentors for sharing their knowledge, abilities, and experience with mentee to support them on their path to become effective teachers**.
- It aims to **foster structured mentoring relationships between mentors and mentees, enabling school teachers and administrators to meet 21st-century educational demands**.
- NEP 2020 emphasizes the importance of high-quality teachers and proposes the National Mission on Mentoring (NMM) to enhance education outcomes and promote holistic teacher development.

National Council for Teacher Education (NCTE)

- It is statutory body of Central Government set up under **NCTE Act, 1993**.

Set up in 1995

- It was set up to **formally oversee standards, procedures and processes in Indian education system.**
- NCTE plans and **co-ordinates the development of teacher education system throughout the country (for both central as well as state governments).**
- It also ensures the maintenance of norms and standards in the teacher education system.
- Its headquarter is in **New Delhi.**

Topic 33. GOVT. RAISES LAKHPATI DIDI SCHEME TARGET

Important for the subject: Schemes

Finance Minister Nirmala Sitharaman, while presenting the interim Budget for 2024-25, said the **target for training 'Lakhpati Didi' would be increased from the existing 2 crore to 3 crore.**

- **Eighty-three lakh self-help groups with 9 crore women are** transforming the rural socio-economic landscape with empowerment and self-reliance.

Lakhpati Didi Scheme:

- It was announced by the Prime Minister in his Independence Day speech on August 15, 2023.
- **Objective:** To encourage women to start micro-enterprises within their villages.
- Under the Lakhpati Didi Initiative, the **government aims to train two crore women.**
- The programme is aimed at **training women in self-help groups (SHGs) so that they can earn a sustainable income of at least Rs 1 lakh per annum per household.**
- The initiative has been initiated by **DAY-NRLM, wherein each SHG household is encouraged to take up multiple livelihood activities coupled with value chain interventions, resulting in a sustainable income of Rs 1 lakh or more per year.**
- Under this scheme, **women will be trained in various skills, such as plumbing, LED bulb making, drone operation and repair, and tailoring and weaving.**
- After completing the training, women will be provided with **opportunities to earn income using their skills.**
- The ministry of rural development is adopting a whole-of-government approach for maximum impact through convergence to transform the rural economy with the enabling of **'Lakhpati Didis'.**

Topic 34. CABINET APPROVES EXTENSION OF ANIMAL HUSBANDRY INFRASTRUCTURE DEVELOPMENT FUND

Important for the subject: Schemes

The Union Cabinet chaired by Prime Minister Shri Narendra Modi approved the continuation of the **Animal Husbandry Infrastructure Development Fund (AHIDF)** for another three years up to 2025-26.

- The **Animal Husbandry Infrastructure Development Fund (AHIDF)** to be implemented under **Infrastructure Development Fund (IDF)** with an outlay of Rs.29,610.25 crore for another three years up to 2025-26.

About Animal Husbandry Infrastructure Development Fund (AHIDF):

The scheme will incentivize investments for:

- **Dairy processing and product diversification, Meat processing and product diversification, Animal Feed Plant, Breed multiplication farm.**
- **Animal Waste to Wealth Management (Agri-waste management) and Veterinary vaccine and drug production facilities.**
- Government of India will provide **3% interest subvention for 8 years** including two years of moratorium for loan up to **90% from the scheduled bank and National Cooperative Development Corporation (NCDC), NABARD and NDDB.**
- The eligible entities are **individuals, Private Companies, FPO, MSME, Section 8 companies.**
- Now the Dairy Cooperatives will also avail benefits for modernization, strengthening of the dairy plants.

Objectives:

- To help **increase milk and meat processing capacity and product diversification** thereby providing greater access for unorganized rural milk and meat producers to organized milk and meat markets.
- To make available **increased price realization for the producer.**
- To make available **quality milk and meat products for the domestic consumer.**
- To fulfill the objective of protein enriched quality food requirement of the growing population of the country and prevent malnutrition in one of the highest malnourished children population in the world.
- Develop **entrepreneurship and generate employment.**
- To promote exports and increase the export contribution in the milk and meat sector.

- To make available quality concentrated animals feed to the **cattle, buffalo, sheep, goat, pig and poultry to provide balanced ration at affordable prices.**

Benefits of the scheme:

- The scheme will be a channel towards employment generation directly and indirectly to **35 lakh people through entrepreneurship development** and aims for wealth creation in the livestock sector.
- The AHIDF has benefited **directly /indirectly approximately 15 lakh farmers.**

Topic 35. GHAR (GO HOME AND RE-UNITE) PORTAL FOR RESTORATION AND REPATRIATION OF CHILD LAUNCHED BY NCPCR***Important for the subject: Schemes***

The **Ministry of Women and Child Development** developed the “**Track Child Portal**”, which enables tracking of the missing and found children in all States/UTs including Maharashtra, Chhattisgarh, North Eastern States and Jharkhand.

- **GHAR portal aims to digitally monitor & track restoration and repatriation of children as per protocols under Juvenile Justice (Care and Protection of Children) Act, 2015.**

The **Track Child portal** is implemented with support and involvement of various stakeholders namely:

- **Ministry of Home Affairs, Ministry of Railways, State Governments/ UT Administrations, Child Welfare Committees, Juvenile Justice Boards, National Legal Services Authority, etc.**
- Standard operating procedures (SOPs) have been issued for the “Track Child” Portal.
- Advisories have also been issued to all States and UTs including Director General of Police of all States & UTs and other stakeholders regarding implementation of **Track Child portal.**
- The Track Child portal is also integrated with the **CCTNS or Crime and Criminal Tracking & Network Systems of the Ministry of Home Affairs.**
- This portal allows interoperability in terms of matching of **F.I.Rs of missing children with the database of Track Child to trace and match missing children** by the concerned State/UT police.
- One component of **Track Child Portal** has “**Khoya-Paya**” where any citizen can report for any missing or sighted children.

About GHAR-GO Home portal:

- A portal namely **GHAR – GO Home and Re-Unite (Portal for Restoration and Repatriation of Child)** has been developed and launched by NCPCR.
- The GHAR portal has been **developed to digitally monitor and track the restoration and repatriation** of children as per the protocols under the Juvenile Justice (Care and Protection of Children) Act, 2015 and Rules thereof.

The following are the salient features of the portal:

- Digital tracking and monitoring of children who are in the **Juvenile Justice system** and have to be repatriated to another Country/State/District.
- Digital transfer of cases of children to the concerned **Juvenile Justice Board/Child Welfare Committee** of the State for speedy repatriation of children.
- Where there is a requirement of a **translator/interpreter/expert**, a request to be made to the concerned State Government.
- **Child Welfare Committees and District Child Protection Officers** can ensure proper restoration and rehabilitation of children by digitally monitoring the progress of the case of the child.
- A checklist format will be provided in the forms so that the children who are hard to repatriate or children who are not getting their **entitled compensation or other monetary benefits** can be identified.
- List of Government implemented schemes are provided, so that at the time of restoration the **Child Welfare Committees can link the child with the schemes to strengthen the family and ensure that child remains with his/her family.**

Topic 36. UNION BUDGET 2024-25 SET BLUEPRINT FOR INDIA'S NEW GREEN DEAL

Important for the subject: Schemes

India's **2024-25 interim budget** marks a significant shift towards **green growth and sustainability**, aligning with **global efforts to combat climate change.**

New Green Deal for India:

- The government, building on previous commitments such as the **Net Zero by 2070 declaration** made in **Glasgow in 2021**, has outlined a **New Green Deal for India.**
- This includes substantial investments in **green energy**, particularly **offshore wind energy**, with a **viability gap funding** for an **initial capacity of 1 gigawatt** to address growth challenges in the **wind energy sector.**

- The budget focuses on **creating a market for clean fuels**, including the **mandatory blending of compressed biogas (CBG)** in **natural gas**, and announces funding to overcome **biomass aggregation challenges** in the **bio-energy industry**.
- Additionally, it introduces a **scheme for bio-manufacturing** to provide **eco-friendly alternatives** to **traditional materials** and aims to advance **coal gasification** to reduce dependence on **crude oil**, thereby insulating India from petroleum price shocks.
- Investments in the **National Green Hydrogen Mission**, **bioethanol production**, and the **expansion of clean transport options**, such as **electric vehicles (EVs)** and **rapid rail transit systems**, underscore the government's commitment to diversifying India's fuel basket and reducing emissions.
- The budget also addresses the need for **secure supply chains for critical minerals** and technologies essential for a **green economy**, alongside initiatives for **rooftop solarisation** to support **EV** charging and reduce greenhouse gas emissions.
- The emphasis on a **Blue economy**, with measures for **coastal resilience** and **sustainable aquaculture**, highlights the comprehensive approach to integrating environmental sustainability with economic development.
- This **green growth model**, aimed at **generating employment** and positioning India as a leader in the global fight against climate change, represents a **balanced approach to environmental and economic priorities**.

Topic 37. A SUNSHINE INITIATIVE

Important for the subject: Schemes

PM Modi launches a **new rooftop solar power scheme**. Finance Minister Nirmala Sitharaman's interim Budget address emphasized Prime Minister Narendra Modi's ambitious plan to provide solar power to one crore households in India through rooftop solar panels.

- The initiative aims to bring substantial savings of **₹15,000 annually for households**.

Eligibility and Subsidies

- **Households consuming less than 300 units of electricity per month** are eligible to install a mid-sized solar system (1-2 kilowatt) under this program.
- The government is set to provide a substantial **subsidy, increasing from the current 40% to 60% of the system's cost**.
- The remaining expenses will be financed by private developers affiliated with public sector enterprises linked to the Power Ministry, ensuring installation quality and reliability.

Net-Metering Mechanism

- The program incorporates a ‘**net metering**’ mechanism, **allowing surplus electricity generated by households to be sold back to the grid to offset the loan.** The implementation of this mechanism may have complexities.
- Although 300 units of monthly consumption may be modest for households with appliances like air conditioners and heaters, it represents a significant average consumption metric by national standards.
- **Approximately 80% to 85% of India’s 25 crore to 30 crore households** consume between 100 and 120 units of electricity per month, making the plan’s eligibility criteria attainable.

Shift from State Discoms to Centre

- Notably, the Center, rather than State power distribution companies (discoms), will lead the solarization efforts.
- Many discoms, often incurring losses, have shown little inclination to promote decentralized solutions like rooftop solar.
- Given the discoms’ detailed knowledge of household-level power supply, bypassing them would not be a viable strategy.

Current Status and Industry Impact

- **Out of the targeted 40 GW of rooftop solar panels, only 12 GW have been installed to date, with household rooftops accounting for just 2.7 GW,** the rest being commercial or building units.
- This initiative can stimulate the domestic solar panel industry, with subsidies available exclusively for domestically produced panels.

Other Initiatives

Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM):

- Encompasses grid-connected Renewable Energy power plants (0.5 – 2 MW).
- Includes Solar water pumps and grid-connected agriculture pumps.

Scheme for Development of Ultra Mega Renewable Energy Power Parks:

- Aims to establish Ultra Mega Renewable Energy Power Parks (UMREPPs) within the existing Solar Park Scheme framework.

National Wind-Solar Hybrid Policy:

- Primary objective: Create a framework for promoting large grid-connected wind-solar PV hybrid systems.
- Aims for efficient utilization of wind and solar resources, transmission infrastructure, and land.
- Addresses renewable power generation variability, enhancing grid stability.
- Encourages innovative technologies and combined operation of wind and solar PV plants.

Atal Jyoti Yojana (AJAY):

- Launched in September 2016.
- Focuses on the installation of solar street lighting (SSL) systems in states where less than 50% households have access to grid power (as per Census 2011).

International Solar Alliance:

- Initiated jointly by the Prime Minister of India and the President of France in November 2015 during COP-21 in Paris.
- Comprises 121 solar resource-rich countries, partially or fully located between the tropics of Cancer and Capricorn, as potential members.

One Sun, One World, One Grid (OSOWOG):

- Aims to facilitate global cooperation and establish a worldwide interconnected ecosystem of renewable energy resources, with a primary focus on solar energy.

National Solar Mission (Part of National Action Plan on Climate Change):

- A comprehensive mission dedicated to the promotion and development of solar energy in India.

Topic 38. UNION BUDGET 2024-25: ALLOCATIONS FOR HEALTH, EDUCATION FAIL TO MEET TARGETS UNDER GOVERNMENT POLICIES***Important for the subject: Schemes***

The health sector received little traction this year too.

For years, experts have suggested that the health budget should be at **least 3 per cent of gross domestic product (GDP)** and even the **National Health Policy, 2017** put the target for increasing the budget to at **least 2.5 per cent of GDP by 2025**.

- The FM allocated only Rs 90,171 crore to the health sector for the crucial election year 2024-2025.
- The health allocation at **5 per cent** should have been **Rs 8,19,000 crore**, given the projected **GDP for 2024-25** of **Rs 3,27,71,808 crore**. At **40 per cent**, the Union government's contribution should have been Rs 3,27,718 crore.
- Similar to health, experts have long advocated for **6 per cent of GDP** to be allocated to education.
- **National Education Policy 2020** also advocates that **6 per cent of the GDP** should be spent on the sector. This comes to **Rs 19,66,309 crore**, but in the current budget, education was allocated **Rs 1,24,638 crore**.
- In the brief budget speech, the finance minister did make a few announcements on health, but none on education.
- One of the health-related announcements did pertain to education—there are plans to set up more medical colleges using the existing infrastructure in the country and a committee is likely to be set-up to make relevant recommendations.
- Experts have warned for decades that these two sectors require additional funding, but government after government has refused to provide it.
- The COVID-19 pandemic should have prompted a push for increased funding, at least in the health sector.
- The fact that school infrastructure played an important role in the fight against the virus suggests that this ministry, too, deserves more support than it has received thus far.
- At village level, on-the-ground networks such as primary health centres and primary schools play a large role in the lives of people.

Topic 39. 5 TAKEAWAYS FROM HIGHER EDUCATION SURVEY 21-22

Important for the subject: Schemes

The **Ministry of Education, Government of India** releases **All India Survey on Higher Education (AISHE) 2021-2022** in January 2024.

- The **Ministry** has been conducting **AISHE** since **2011** which covers all Higher Educational Institutions (HEIs) in the country registered with AISHE.
- The report of the **All India Survey of Higher Education (AISHE) 2021–22** was made public on January 25 and found that **4.33 crore students** are currently enrolled in higher educational institutes up from **4.14 crore in 2020-21, and 3.42 crore in 2014-15**.
- The survey captures total student enrolment in eight different levels: **undergraduate, postgraduate, PhD, MPhil, diploma, PG diploma, certificate, and integrated programmes**.
- **In all, 10,576 standalone institutions, 42,825 colleges, and 1,162 universities/university level institutions responded to the survey.**

Key Findings of the Report:

- Female enrolment in Higher Education **increases to 2.07 crore in 2021-22 from 1.57 crore in 2014-15**(an increase of 50 lakh students, 32% increase).
- GER increases to **28.4 in 2021-22 from 23.7 in 2014-15**. Female GER increases to **28.5 in 2021-22 from 22.9 in 2014-15**.
- Female GER continues to be more than male GER for fifth consecutive year since 2017-18
- Significant **44% increase in enrolment of SC students since 2014-15** (66.23 lakh in 2021-22 from 46.07 lakh in 2014-15)
- Notable increase of **51% in enrolment of Female SC Students in 2021-22** (31.71 lakh), compared to 2014-15(21.02 lakh)
- Substantial increase of **65.2% in enrolment of ST students in 2021-22**(27.1 lakh), compared to 2014-15(16.41 lakh)
- Remarkable **80% increase in the enrolment of Female ST Students** in 2021-22 (13.46 lakh), since 2014-15 (7.47 lakh)
- Increase of **45% in OBC Student enrolment in 2021-22** (1.63 crore) from 2014-15 (1.13 crore)
- Significant **49.3% increase in Female OBC Students in 2021-22** (78.19 lakh) since 2014-15 (52.36 lakh).
- Total Ph.D. enrolment has increased **81.2% in 2021-22 (2.13 lakh) from 2014-15 (1.17 lakh)**.

- Female Ph.D. enrolment has doubled in **2021-22(0.99lakh)** from **2014-15(0.48 lakh)**.
- **42.3 % increase in Female Minority Student enrolment** since 2014-15 (15.2 lakh in 2021-22 from 10.7 lakh in 2014-15).
- **341 Universities/University** level institutions have been established since 2014-15.
- Female faculty/teachers have increased to **6.94 lakh in 2021-22 from 5.69 lakh in 2014-15 (an increase of 1.25 lakh, i.e., 22% since 2014-15).**

Five important key takeaways

Female enrolment greater than male

- The number of women enrolled in **higher educational institutes has steadily increased**, the AISHE report showed.
- From **1.5 crore women enrolled in 2014-15**, there has been a **jump of 32% to 2.07 crores enrolled in 2021-22**.
- In 2021-22, the total PhD enrolment in the country is **2.12 lakh of which 98,636 are women**.
- Eight years ago, **only 47,717 women were enrolled in PhD programmes**.
- The proportion of women enrolled in higher education, compared to men, has also gone up.
- The 91 lakh more students to have joined higher educational institutes in 2021-22 (when compared to 2014-15), 55% were women.
- The proportion of **women is highest at the postgraduate level**, where 55.4% students are female.

GER and Gender Parity

- **Gross Enrollment Ratio indicates how many students** are part of the higher education system in a given population.
- The estimated **GER for the age group 18-23 years in India is 28.4**, the AISHE 2021-22 report said (based on population data from the 2011 census).
- In terms of state-wise data, **Chandigarh, at 64.8%, boasts of the highest GER, followed by Puducherry at 61.5%, Delhi at 49%, and Tamil Nadu at 47%.**
- Another indicator called the **Gender Parity Index (GPI) shows the ratio of the female GER to male GER**.
- A **GPI of 1 indicates parity between the two genders** where **any number between 0 and 1 shows a disparity in favor of males**, whereas a GPI greater than 1 indicates a disparity in favor of females.

- The survey observed that in **26 states and Union Territories**, the GER is in favor of women.
- At the all-India level GPI is **1.01**, and for SC and ST categories the GPI is **1.01** and **0.98** respectively.

Arts over the sciences in graduation, PG

- The survey showed that the **Bachelor of Arts (BA)** programme has the **highest enrolment**, with **1.13 crore students 34.2% of total undergraduate enrolment** across India.
- In all, **3.41 crore students are enrolled in UG programmes**.
- Among disciplines at undergraduate level, in 2021-22, **the enrollment is highest in Arts (34.2%), followed by science (14.8%), commerce (13.3%) and engineering and technology (11.8%). BA (Hons) accounts for 20.4 lakh (6.2%),** the survey shows.
- The social science stream has also the **highest number of postgraduate students enrolled at 10.8 lakh**.
- The latest survey shows that the **Master of Arts (MA)** programme has the **highest enrolment**, with 20.9 lakh students, which is 40.7% of total postgraduate enrolment.
- At PhD level, however, social sciences stood at third spot after engineering and science.
- While 52,748 are pursuing a PhD in engineering, and 45, 324 in science, 26,057 students are pursuing PhD in the social sciences.

Primacy of government institutions

- **73.7% of all students attend government universities**, which make up only 58.6% of all universities.
- In the government sector, state public universities have the largest share of enrolment, accounting for around **31% of the total enrolment for universities**.
- **Government-owned universities have an enrolment of 71.06 lakh**, whereas enrolment in privately managed universities is 25.32 lakh.
- Even though there are **more private universities**, students prefer government educational institutions.

Demographics of students graduating

- During the 2021–22 academic year, 1.07 crore students were estimated to **have graduated from undergraduate, graduate, doctorate, master's, and other diploma/certificate programmes**.
- Among these **1.07 crore students, 54.6 lakh or roughly 50.8% are women**.

- In 2021-22 around **35% of the students belong to Other Backward Classes (OBC), 13% are from Scheduled Caste (SC) community and 5.7% of the graduates are from Scheduled Tribe (ST) community.**
- The graduation rate in arts and social sciences streams is higher than others. At the UG level, BA degree has been awarded to 24.16 lakh — **the highest among all programmes.**
- Even at PG level, the number of MA graduates are maximum with 7.02 lakh degrees awarded in 2021-22.
- At PhD level, the highest graduates are in the science stream with 7,408 followed by engineering and technology at 6,270 graduating students.

About AISHE:

- AISHE was established by the **Ministry of HRD for conducting an annual web-based survey, thereby portraying the status of higher education in the country.**
- The survey is conducted for **all educational institutions in India on many categories like teachers, student enrolment, programs, examination results, education finance, and infrastructure.**
- This survey is used to make **informed policy decisions** and research for the development of the education sector.
- This Report provides key **performance indicators on the current status of Higher education in the country.**

Topic 40. WORLD'S LARGEST GRAIN STORAGE PLAN

Important for the subject: Schemes

The Minister of Cooperation, Shri Amit Shah in a written reply to a question in the Lok Sabha, **mentioned about the 54 initiatives taken by the Ministry of Cooperation.**

- The **Ministry of Cooperation was created by transferring the existing entries related to cooperation and cooperative** in the business of the erstwhile Ministry of Agriculture, Cooperation and Farmers Welfare vide Cabinet Secretariat's Gazette Notification dated 6th July, 2021.
- The Ministry of Cooperation, since its inception on 6th July, 2021, has undertaken several initiatives to realize **the vision of "Sahakar-se-Samriddhi" and to strengthen & deepen the cooperative movement from Primary to Apex level Cooperatives in the country.**

Various initiatives undertaken:

World's Largest Decentralized Grain Storage Plan in Cooperative sector:

- Government has approved a plan to create warehouses, custom hiring centers, primary processing units and other agri infrastructure for grain storage at PACS level, through convergence of **various GOI schemes, including AIF, AMI, SMAM, PMF ME, etc.**
- This will **reduce wastage of food grains and transportation costs, enable farmers to realize better prices** for their produce and meet various agricultural needs at the PACS level itself.
- **27 States/ UTs and National level Cooperative Federations such as National Cooperative Consumers Federation (NCCF) and National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED),** have identified more than 2,000 PACS for creation of storage capacity under the Pilot Project.
- **An MoU has been signed between Ministry of Cooperation, MeitY, NABARD and CSC e-Governance Services India Limited** for providing more than 300 e-services such as banking, insurance, Aadhar enrolment/ updation, health services, PAN card and IRCTC/ Bus/ Air ticket, etc. through PACS.

Micro-ATMs to Bank Mitra Cooperative Societies for providing doorstep financial services:

- **Dairy and Fisheries cooperative societies can be made Bank Mitras of DCCBs and StCBs. To ensure their ease of doing business, transparency and financial inclusion.**
- Micro-ATMs are also being given to these **Bank Mitra Co-operative Societies with support from NABARD to provide ‘Door-step Financial Services’.**

Promotion of training and awareness through National Council for Cooperative Training (NCCT):

- By increasing its reach, **NCCT has conducted 3,287 training programs** and provided training to 2,01,507 participants in FY 2022-23.

Computerization of Agriculture and Rural Development Banks (ARDBs):

- To **strengthen the long-term cooperative credit structure, the project of computerization of 1,851 units of Agriculture and Rural Development Banks (ARDBs)** spread across 13 States/ Union Territories has been approved by the Government.
- **NABARD is the implementing agency** for the project and will develop a national level software for ARDBs.

Multi-State Co-operative Societies (Amendment) Act, 2023:

- Amendment has been brought in the **MSCS Act, 2002 to strengthen governance, enhance transparency, increase accountability, reform electoral processes** and incorporate provisions of the **97th Constitutional Amendment** in the Multi State Cooperative Societies.

Three new National Level Multi-State Societies

New National Multi-State Cooperative Seed Society for certified seeds:

- Government has established a new apex multi-state cooperative seed society under the MSCS Act, 2002, namely **Bhartiya Beej Sahkari Samiti Limited (BBSSL)** as an **umbrella organization** for quality seed cultivation, production and distribution under a single brand.
- Wheat, mustard, and pulses (gram, pea) breeder seeds have been planted across 1,750 acres.

New National Multi-State Cooperative Organic Society for organic farming:

- Government has established a **new apex multi-state cooperative organic society under the MSCS Act, 2002**, namely **National Cooperative Organics Limited (NCOL)** as an umbrella organization to produce, distribute and market certified and authentic organic products.
- Six organic products have been launched by NCOL under the “Bharat Organics” brand.

New National Multi-State Cooperative Export Society for promoting exports:

- Government has established a new apex multi-state cooperative export society under the MSCS Act, 2002, namely **National Cooperative Export Limited (NCEL)** as an **umbrella organization to give thrust to exports from the cooperative sector.**

CO's Co-operative Models:

- **Indian Farmers Fertiliser Cooperative Society, known as IFFCO, is a Multi-State Cooperative Society.**
- **IFFCO has been ranked as the No. 1 cooperative** in the world in the line-up of 300 top cooperatives of the world in the 2022 edition of the **Annual World Cooperative Monitor (WCM)** report based on the ratio of turnover over GDP per capita income, designed by **International Cooperative Alliance (ICA).**

Topic 41. SHRESHTA SCHEME

Important for the subject: Schemes

Minister of State for **Social Justice and Empowerment Shri A. Narayanaswamy** in a written reply in Lok Sabha, mentioned about the objectives of the Shreshta scheme.

Objectives of the scheme:

- **The objective of SHRESHTA is to enhance the reach of development Intervention of the Government and to fill the gap in service deficient SCs dominant areas, in the sector of education through the efforts of grant-in-aid institutions (run by NGOs) and residential high schools offering high quality education.**

- It aims to provide an environment for **socio economic upliftment and overall development** of the Scheduled Castes (SCs) by providing financial assistance to best private residential schools affiliated by CBSE/ State Board in class **9th & 11th for completion of education till 12th standard.**
- Financial assistance is also provided to **Non-Governmental Organizations (NGOs)/ Voluntary Organisations (VOs) for running residential, non-residential schools and hostels** having adequate infrastructure and maintaining good academic quality for SC students.

Provision of Bridge course:

- There is provision of **Bridge course in the scheme to ensure that the SC students** admitted can catch up with the rest of the class.
- **Bridge courses target enhancing the capability of the student to easily adapt to the environment of the school.**
- Provisions have been incorporated for a **bridge course in the selected schools for students selected under the Scheme, outside-the-school-hours** after identifying the individual academic requirements.
- The **cost of bridge course i.e. 10% of annual fee shall also be borne by the Department.**
- The progress of the students would be monitored by **the Ministry from time to time.**

Various modes under the scheme:

The scheme is being implemented in two Modes.

MODE-1:

- In mode-I, each year a specified number of meritorious SC students around 3000 in States/UTs are selected through the National Entrance Test for SHRESHTA (NETS) conducted by the National Testing Agency (NTA) and admitted in the private residential schools affiliated to CBSE/State Boards.
- Under the mode 1 of the scheme, students are admitted in 9th and 10th class and financial assistance is provided for them till completion of education upto 12th standard.
- Thereafter, students may take benefits under Post Matric Scholarship or Top Class Education Scheme to continue their further studies for securing their future opportunities.

MODE-2:

- Under mode-2, financial assistance is provided to the NGOs for running the schools/hostel projects related to the Education sector to Scheduled Caste students.
- 13500 slots every year have been marked for SC students.

Other provisions in the scheme

Selection of schools:

- Best performing CBSE based private residential schools, having more than 75% pass percentage for class 10 and 12 for the last three years are selected by a Committee for admission of selected students.

Selection of students:

- Approx 3000 (1500 for 9th class and 1500 for class 11th tentative) SC students, whose parents annual income is upto 2.5 lakh.
- They will be selected every year under the Scheme through a national level test conducted by **National Testing Agency (NTA)**, choices of schools shall be offered to the students in accordance with their merit.
- Total fee for the student covering the school fee (including tuition fees) and hostel fee (including mess charges) would be borne by the Department.

Topic 42. TIME TO RETHINK, REIMAGINE AND REFORM LEGAL SYSTEMS

Important for the subject: Polity

Prime Minister Narendra Modi underscored the need to “rethink, reimagine and reform” legal systems even as Chief Justice of India D.Y.

- Chandrachud pointed out that government law officers should remain impervious to the politics of the day and conduct themselves with dignity in court.

Attorney General of India

- Under **Article 76**, The Constitution of India has provided for the office of the Attorney General (AG) for India.
- He is the **highest law officer in the country**. As a **chief legal advisor to the government of India**, he advises the union government on all legal matters.
- He is also the **primary lawyer** representing the Union Government in the Supreme Court and High Court of India.

The president has assigned the following duties to the AG:

- To **appear on behalf of the Government of India** in all cases in the Supreme Court in which the Government of India is concerned.
- To **represent the Government of India in any reference made by the President** to the Supreme Court under Article 143 of the Constitution.
- To appear (when required by the Government of India) in any High Court in any case in which the Government of India is concerned.

About Solicitor General of India

- **Law Officer (Conditions of Service) Rules, 1987** provides for the functions of Law Officer which includes the Attorney-General for India, the Solicitor-General for India.
- Additional Solicitor-General for India. **Unlike the AG, Solicitor General's duties and functions are not provided in the Constitution of India.**
- He is the **secondary law officer of India** after then attorney General of India and assists the AG in performing his responsibilities.
- Under the Conditions of Service Rules, Law Officer including the Solicitor General is appointed **for a period of 3 years** and can be re-appointed.

Duties of Solicitor General Law Officer of India

- **Give advice to the Government of India** upon such legal matters, and perform legal duties which may be referred or assigned by the Government of India.
- **Appear in the Supreme Court or in any High Court on behalf of the Government of India** in cases including suits, writ petitions, appeal and other proceedings in which the Government of India is concerned as a party or is otherwise interested.
- **Represent the Government of India in any reference made by the President** to the Supreme Court under **Article 143** of the Constitution.
- Discharge such other functions as are conferred on a Law Officer by or under the Constitution or any other Law for the time being in force.

Additional Solicitor General of India

- The Additional Solicitor General of India, also known as the ASG, is the third-ranked law-officer in the Indian government.
- The **post of ASG is not constitutional as the constitution does not have any provisions regarding this.**
- The seat of the Additional Solicitor-General of India may be at New Delhi or Mumbai or Chennai or Allahabad as the Government of India specifies.
- The post of ASG is **governed by Law Officers (Conditions of Service) Rules, 1987.**

Advocate General

- **Under Article 165 of the Constitution** of India the Governor of each State shall appoint a person who is **qualified to be appointed as a Judge of a High Court to be Advocate General for the State.**
- The Advocate General is the **Highest legal officer in the state in India.** He possesses the **complete authority to present himself in any court within the state.**

- He lacks voting privileges in the proceedings of the state legislature or any committees initiated by the state legislature.
- However, **he does retain the right to speak and participate in these proceedings.**

Topic 43. 30 INDIAN FUGITIVES WERE LOCATED ABROAD IN 2022: GOVT. REPORT

Important for the subject: Polity

As many as 278 fugitives wanted in other countries were located in India in 2022, says the Department of Personnel and Training (DoPT), 2022-23 annual report.

- **Interpol** shared 304 reports on “foreign terrorist fighters” with the **Central Bureau of Investigation (CBI)** in 2022.
- The reports received by the CBI are forwarded to **the Multi Agency Centre (MAC)** under the Intelligence Bureau and the National Investigation Agency (NIA).

About Multi-Agency Centre (MAC)

- It is a common counter-terrorism grid under the Intelligence Bureau (IB) that was made operational in 2001 post-Kargil war.
- It is a nodal establishment for sharing intelligence inputs among various agencies.
- It is located in Delhi while state capitals have subsidiary MACs (SMACs) where daily meetings are held to analyse inputs received in the previous 24 hours.
- There is also a focussed group meeting of the MAC where specific information on a specific theatre is discussed where only concerned agencies participate.
- All organisations that are in any way involved in the counter-terrorism effort are a member of this centre.
- All the States have a subsidiary multi-agency centre (SMAC) located in all State capitals.

Coverage:

- As many as 28 organisations, including the Research and Analysis Wing (R&AW), armed forces and State police are part of the platform and various security agencies share real-time intelligence inputs on the MAC.
- There are around 400 secured sites connected with the MAC headquarters.

Fugitive Economic Offender

- A fugitive economic offender, according to the Fugitive Economic Offenders Act of 2018 (FEO), is one who has committed one or more scheduled crimes involving **100 crore**

rupees or more and has either fled India or refuses to return in order to evade or face criminal punishment.

- The act allows for the confiscation of the properties of fugitive economic offenders and creates a mechanism for their speedy trial. The act aims to tackle economic offenses and prevent financial fraud.

What is Letters Rogatory (LR)?

- The term 'Letters Rogatory' is derived from the Latin term rogatorius. Letters Rogatory are the letters of request sent by the Court of one country to the Court of another country for obtaining assistance in investigation or prosecution of a criminal matter.

What is Mutual Legal Assistance?

- Mutual Legal Assistance is a mechanism whereby countries cooperate with one another in order to provide and obtain formal assistance in prevention, suppression, investigation and prosecution of crime.
- This ensures that the criminals do not escape or sabotage the due process of law for want of evidence available in different countries.
- The Ministry of Home Affairs is the Central Authority of India for dealing with requests of mutual legal assistance in criminal matters.
- The Central Authority transmits and receives all requests for assistance either directly or through diplomatic channels.
- The Mutual Legal Assistance Treaties (MLATs) in criminal matters are the bilateral treaties entered between the countries for providing international cooperation and assistance.

Topic 44. PANCHAYATS EARN ONLY 1% OF THEIR REVENUE THROUGH TAXES

Important for the subject: Polity

Only 1% of the revenue of panchayats was earned by them, with the rest being raised as grants from the State and the Centre. Specifically, 80% of the revenue was from Central government grants; only 15% was from State government grants.

About Panchayati Raj

- **Self-Government:** The term Panchayati Raj in India signifies the system of rural local self-government.
- **Grass Root Level Democracy:** It has been established in all the states of India by the Acts of the state legislatures to build democracy at the grass root level.

- Panchayati Raj Mahatma Gandhi advocated Gram Swaraj or village self-governance as a decentralised form of governance in which villages would be responsible for their own affairs, serving as cornerstones of India's political system.
- **73rd Constitutional Amendment Act (CAA):** It was constitutionalised through the 73rd CAA of 1992. The act has given a practical shape to **Article 40** of the Constitution.
- This act has added a new Part-IX to the Constitution of India entitled as 'The Panchayats' and consists of provisions from **Articles 243 to 243 O**.
- The act has also added a new Eleventh Schedule to the Constitution. This schedule contains **29 functional items** of the panchayats.

Assessment of Panchayati Raj Finance

- **Central Finance Commissions (CFCs):** Successive CFC have recommended a consistent increase in grants to PRIs, from 4,381 crore by the Tenth CFC to 2.37 lakh crore by the Fifteenth CFC.
- **State Finance Commission (SFC):** **Article 243-I** of the Constitution stipulates the establishment of a SFC every five years to assess the financial status of Panchayats and propose a framework for sharing taxes between the State and Panchayats.
- **Revenue Collection: Article 243-H** of the Constitution empowers Panchayats to impose, collect, and allocate taxes, duties, tolls, and fees.
- **Panchayati Raj:** The decisions regarding taxes to be decentralised to local governments are, however, mainly at the **discretion of State legislatures**.
- **Other Funding Sources:** In addition to these revenue sources, Panchayats also receive grants from international organisations and funds for executing Centrally Sponsored Schemes (CSSs) like the **Rashtriya Gram Swaraj Abhiyan**, the SVAMITVA, the National Horticulture Mission, etc.

Government Initiatives to Strengthen Panchayati Raj Institutions (PRIs)

- **e-Gram Swaraj e-Financial Management System:** It is a Simplified Work Based Accounting Application for Panchayati Raj that assists in enhancing the credibility of Panchayat through inducing greater devolution of funds to PRIs.
- **Rashtriya Gram Swaraj Abhiyan (RGSA) Scheme:** It integrates various interventions within the Ministry of Panchayati Raj (MoPR) and across sectors, employing participatory local planning at the Gram Panchayat level.
- **Sansad Adarsh Gram Yojana:** It envisions the holistic development of villages, transforming them into Adarsh Grams.

- As part of the initiative, each Member of Parliament (MP) is tasked with promoting a holistic development of three Gram Panchayats (GPs) by 2019 and another 5 GPs by 2024.
- **LSDGs through PRIs:** The Ministry has adopted a thematic approach for LSDGs leveraging a wide network of third tier of Government, the goals on these themes to be attained by 2030 in a graduated manner.
- **Panchayat Development Index (PDI):** To measure the progress on LSDGs and to carry out assessment to prepare evidence-based policy, MoPR constituted a Committee to prepare mechanisms for computation of PDI.
- **Gram Urja Swaraj Abhiyaan:** MoPR has collaborated with the Ministry of New and Renewable Energy to include the Gram Panchayats under all its schemes focusing on adoption of renewable energy.
- **National Panchayati Raj Day (NPRD):** NPRD is celebrated annually on April 24th by the MoPR to commemorate the 73rd CAA of 1992.
- **Theme for 2023- Panchayaton ke Sankalpon ki Siddhi ka Utsav:** Celebrated in line with the directives of adopting “whole-of-society” and “whole-of- government” approach.

Topic 45. PRACTICE OF PROXY REPRESENTATIVE

Important for the subject: Polity

Union Minister of State for Panchayati Raj, Shri Kapil Moreshwar Patil in a written reply in Lok Sabha mentions about the **practice of sarpanch pati / pradhanpat in our Panchayati Raj System.**

About Proxy Representation:

- The practice of sarpanch pati/pradhanpat highlights the necessity and **importance of capacity building of Elected Women Representatives (EWRs)** and generating awareness among them.

Steps taken in this regard:

- Extensive exercise of capacity building of Elected Representatives, including EWRs, through the scheme of **Rashtriya Gram Swaraj Abhiyan.**
- The Ministry has been engaging with the EWRs **through a series of workshops, conferences, committees and expert groups on the issues of women empowerment and women leadership.**
- The Ministry has issued advisories to States to facilitate **holding of separate Ward Sabha and Mahila Sabha meetings prior to Gram Sabha meetings.**

- Advisories have also been issued to States for enhancing the presence and participation of women in **Gram Sabha and Panchayat meetings, allocation of Panchayat funds for women-centric activities, combating the evil of women trafficking, female foeticide, child marriage etc.**
- The Ministry has also been encouraging increased involvement of women in the functioning of Panchayats through active participation in the Gram Sabha meetings for preparation of **Gram Panchayat Development Plans and various schemes being implemented by the Panchayats.**

About Rashtriya Gram Swaraj Abhiyan

- **Rashtriya Gram Swaraj Abhiyan (RGSA) was launched on 24th April 2018** as an umbrella scheme of the Ministry of Panchayati Raj, Govt. of India.
- It is a unique scheme proposed to **develop and strengthen the Panchayati Raj System** across India in the rural areas. It is a centrally sponsored scheme

Objectives of RGSA

- Develop governance capabilities of **PRIs to deliver on the SDGs.**
- **Enhance capabilities of Panchayats for inclusive local governance** with focus on optimum utilization of available resources and convergence with other schemes to address issues of national importance.
- Enhance **capabilities of Panchayats to raise their own sources of revenue.**
- **Strengthen Gram Sabhas to function effectively** as the basic forum of people's participation, transparency and accountability within the Panchayat system.
- Promote devolution of powers and responsibilities to Panchayats according to **the spirit of the Constitution and PESA Act 1996.**

Topic 46. PLEA BARGAINING

Important for the subject: Polity

Prisons'/'persons detained therein' is a **"State List"** Important for the subject under **Entry 4 of List II** of the Seventh Schedule to the Constitution of India. Administration and management of prisons and prisoners is the responsibility of respective State Governments.

- However, the Ministry of Home Affairs (MHA) has also been supplementing the efforts of the State Governments in this regard. The initiatives taken by the Ministry of Home Affairs to address the issue of undertrial prisoners are as follows:
- The Government of India inserted Section 436A in the Code of Criminal Procedure (CrPC) which provides for release of an under-trial prisoner on bail on undergoing detention for a

period extending up to one half of the maximum period of imprisonment specified for an offence under any law.

- The concept of plea bargaining has been introduced by inserting a “Chapter XXIA” on “**Plea Bargaining**” (Sections 265A to 265L) in the Code of Criminal Procedure, 1973, which enables pre-trial negotiation between the defendant and the prosecution.

Plea Bargaining:

- It refers to a person charged with a criminal offence (accused) negotiating with the prosecution for a lesser punishment than what is provided in law by pleading guilty to a less serious offence.
- E-prisons Software, which is a Prison Management Application integrated with Interoperable Criminal Justice System provides facility to State Jail authorities.
- To access the data of inmates in a quick and efficient manner and helps them in identifying the inmates whose cases are due for consideration by the Under Trial Review Committee, etc.
- The Model Prison Manual 2016 circulated to all States/ Union Territories has specific chapters on “Legal Aid” and “Undertrial Prisoners”, etc.
- Which provide detailed guidelines on the facilities which may be provided to undertrial inmates, namely legal defence, interview with lawyers, application to Courts for legal aid at Government cost etc.
- The State Legal Services Authorities have established **Legal Service Clinics** in jails, which provide free legal assistance to persons in need.
- These Legal Service Clinics are managed by Empanelled Legal Services Advocates and trained **Para-Legal Volunteers**.
- These clinics have been established to ensure that no prisoner remains unrepresented and legal aid and advice is provided to them.
- National Legal Services Authority holds awareness generation camps in jails to generate awareness about availability of free legal aid, plea bargaining, Lok Adalats and legal rights of inmates, including their right to bail, etc.
- The **National Legal Services Authority** had prepared a Standard Operating Procedure (SOP) for Under-Trial Review Committees, which has been circulated by MHA to all States/Union Territories for making best use of the same and provide relief to prisoners.

Topic 47. RAJYA SABHA PASSES BILLS TO ADD PVTGS OF ODISHA, A.P. IN ST LISTS

Important for the subject: Polity

Rajya Sabha passed the Constitution (STs) Order Amendment Bill 2024 and the Constitution (SCs and STs) Order Amendment Bill 2024, presented by the **Ministry of Tribal Affairs**.

About the Bills:

- Among the additions were notably seven Particularly Vulnerable Tribal Groups (PVTGs) (a subset of STs) – four in Odisha and three in Andhra Pradesh.
- The independent names of these PVTGs had been specifically added as **synonyms or sub-tribes of communities already on the ST lists of these States**.

In Odisha, the PVTG communities added are –

- **Pauri Bhuyan and Paudi Bhuyan** as synonyms of the Bhuyan tribe;
- The **ChuktiaBhunja** as a synonym of the Bhunjia tribe;
- The **Bondo** as a sub-tribe of the Bondo Poraja tribe; and
- The **Mankidia** as a synonym for the Mankirdia tribe.
- In **Andhra Pradesh**, the PVTG communities included **Bondo Porja and Khond Porja** as synonyms of the Porja tribe and the **Konda Savaras** as a synonym for the Savaras tribe.

Other Additions and Changes:

- In addition to this, the Bill to amend Odisha's ST list also **shifted two entries – Tamadia and Tamudia – from the Scheduled Castes list to the Scheduled Tribes list**.
- The Bill also added synonyms, phonetic variations and sub-tribes of at least eight existing communities in the State's ST list.
- Further, Odisha's ST list was expanded by adding two communities to it as new entries. These are –
- The **Muka Dora community** (and synonyms) in undivided Koraput District which includes Koraput, Nowrangapur, Rayagada and Malkangiri districts; and
- The **Konda Reddy** (and synonyms) community.

About PVTGs

- According to the Ministry of Tribal Affairs (MoTA), India has 75 PVTGs, who are characterized by –

- Pre-agriculture level of technology, Stagnant or declining population, Extremely low literacy, and Subsistence level of economy.
- PVTGs were recognised as a separate category based on the findings of the 1961 Dhebar Commission.
- In 1975, there were 52 PVTGs and the list had been expanded to 75 across 18 states and Union Territories.
- Data from the MoTA and the 2011 Census shows that Odisha has the largest population of PVTGs at 8.66 lakh, followed by MP at 6.09 lakh and Andhra Pradesh (including Telangana) at 5.39 lakh.
- The total PVTG population is more than 40 lakh and the largest PVTG is Odisha's Saura community, numbering 5.35 lakh.

Government Initiatives for the Welfare of the PVTGs:

- The Union Budget 2023-24 announced the launch of the **PM PVTG Development Mission**.
- This will saturate PVTG households and habitations with basic facilities such as safe housing, clean drinking water and sanitation, improved access to education, health and nutrition, etc.
- An amount of Rs.15,000 crore will be made available to implement the Mission in the next three years under the **Development Action Plan for the Scheduled Tribes (DAPST)**.
- The **PM-JANMAN (Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan)** has been launched to enhance the socio-economic conditions of PVTGs.
- The PM-JANMAN (comprising Central Sector and Centrally Sponsored Schemes) to focus on 11 critical interventions through 9 Ministries.
- The government has been consistently following up with respective State governments over the declining populations of several PVTG communities across the country.

Topic 48. UNDERSTANDING THE DELIMITATION EXERCISE

Important for the subject: Polity

The impending delimitation exercise for Lok Sabha and State Legislative Assemblies, based on the **first Census after 2026**, has sparked discussions and raised pertinent questions.

About Delimitation

- Delimitation entails **fixing the number of seats and boundaries of territorial constituencies**, including the reservation of seats for Scheduled Castes (SC) and Scheduled Tribes (ST), based on census data.
- **Article 82 (Lok Sabha) and Article 170 (State Legislative Assemblies)** mandate readjustment of seats after each Census, performed by the Delimitation Commission.
- Delimitation exercises were conducted post the **1951, 1961, and 1971 Censuses**, highlighting its periodic nature.

Delimitation Commission

- The Delimitation Commission is a high-powered committee entrusted with the task of drawing and redrawing boundaries of different constituencies for state assembly and Lok Sabha election.
- It is appointed by the President and works in collaboration with the Election Commission.

The Commission consists of –

- A retired or working Supreme Court Judge (chairperson)
- Election Commissioner
- Concerned State Election Commissioners or Commission's orders have the force of law and cannot be called in question before any court.
- The orders are laid before the Lok Sabha and the legislative assemblies concerned, but they cannot effect any modifications in the orders.

Need for Delimitation

- **Democracy and Representation:** The essence of democracy mandates 'one citizen-one vote-one value,' necessitating periodic readjustment of seats to reflect population changes.

- **Freezing of Seats:** Seats have been frozen since 1971 to encourage population control, with the freeze extended until 2026 through the 84th Amendment Act.

Challenges

- **Uneven Population Growth:** Population disparities among states pose challenges, with some states experiencing rapid growth while others stagnate.
- **Options Discussed:** Options include redistributing existing seats among states or increasing the total seats to reflect population changes.
- **Constituency Shrinkage:** Electorates often lose their representation due to the merger of constituencies.

Topic 49. SCIENTISTS FUSE BRAIN-LIKE TISSUE WITH ELECTRONICS

Important for the subject: Science and technology

Recently, a team of researchers has combined brain-like tissue with electronics to create an ‘organoid neural network’ known as Brainware. It is **capable of recognizing voices and solving complex math problems**.

Working Process:

- Researchers utilized lab-grown real human brain tissue to create mini-brains known as organoids.
- Brain organoids are 3D clusters of brain cells. These organoids are not actual brains, they are simply tissue structures without thoughts or feelings. **They help in studying how the brain works without using a real human brain.**
- Brainware connects these organoids to microelectrodes through a method of artificial neural network known as reservoir computing.
- This device comprises **three layers: input, reservoir, and output.**
- The brain organoid, which is connected to microelectrodes, acts as the reservoir. It received **inputs via electrical stimulation from the input layer (live brain cells).**
- **The output layer comprised modified conventional computer hardware programmed to recognize Brainware’s neural activity.**
- The researchers showcased Brainware’s capabilities by forecasting a Henon map.
- **Henon map is a mathematical function that plots a curve on a graph, displaying chaotic or non-chaotic behaviour based on the values of two variables.**

Future Prospects:

- It marks a significant advancement in **multiple areas of science and engineering, such as tissue engineering, electrophysiology, and neural computation.**

Topic 50. BIDEN ADMINISTRATION NOTIFIES U.S. CONGRESS OF 31 MQ9B UAV SALE TO INDIA

Important for the subject: Science and technology

The U.S. Congress formally notified of the possible sale of 31 MQ9B high altitude long endurance armed Unmanned Aerial Vehicles (UAV) to India at an estimated \$3.99 billion.

MQ-9B Predator Drone

- The MQ-9B drone is a variant of the MQ-9 “Reaper”, an unmanned aerial vehicle (UAV) capable of remotely controlled or autonomous flight operations.
- These are high-altitude long-endurance drones armed with strike missiles which can take out enemy targets with high accuracy.
- It was developed by General Atomics Aeronautical Systems (GA-ASI), primarily for the United States Air Force (USAF).
- The MQ-9B has two variants — Sky Guardian and its sibling Sea Guardian. The Indian Navy has been operating the MQ-9B Sea Guardian since 2020.

Features of MQ-9B Sea Guardian:

- It can carry up to 5,670 kg and has a fuel capacity of 2,721 kg.
- The drone can operate at over 40,000 feet.
- The Predator also has a maximum endurance of 40 hours, making it useful for long-hour surveillance.
- It can support land, maritime surveillance, anti-submarine warfare, anti-surface warfare, strike, electronic warfare and expeditionary roles.
- It is also capable of automatic take-offs and landings.
- It can safely integrate into civil airspace, enabling joint forces and civil authorities to deliver real-time situational awareness anywhere in the maritime domain — day or night.

Topic 51. BIG LEAP IN SPACE DEFENCE TECHNOLOGY: GREEN PROPULSION SYSTEM, DEVELOPED UNDER DRDO'S TECHNOLOGY DEVELOPMENT FUND, SUCCESSFULLY DEMONSTRATES IN-ORBIT FUNCTIONALITY

Important for the subject: Science and technology

A Green Propulsion System developed under the **Technology Development Fund (TDF) scheme of DRDO** has been successfully demonstrated in-orbit functionality on a payload launched by **PSLV C-58 mission**.

- This project **1N Class Green Monopropellant thruster** for altitude control and orbit keeping of micro satellites was sanctioned to a Bengaluru-based start-up Bellatrix Aerospace Pvt Ltd (Development Agency).
- The **Telemetry Data from PSLV Orbital Experimental Module (POEM) at ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru** has been validated with ground level solution and is found to have exceeded all performance parameters.

Features of the technology:

- This innovative technology has resulted in a **non-toxic and environment-friendly propulsion system for low orbit space**.
- The system consists of **indigenously-developed Propellant, Fill and Drain Valves, Latch Valve, Solenoid Valve, Catalyst Bed, Drive Electronics, etc.**
- It is ideal for space missions with high thrust requirements.
- The complete project has been carried out by the Development Agency under **guidance of Project Monitoring & Mentoring Group of DRDO**.
- It has demonstrated **pulsed mode and steady state firing in vacuum, passivation of residual propellant in outer space, propellant realization and establishing of filling procedure** under the TDF.

About Technology Development Fund (TDF):

- **Technology Development Fund (TDF)** has been established to promote self-reliance in Defence Technology as a part of the **'Make in India' initiative**.
- It is a programme of the **Ministry of Defence**.
- This programme is executed by the **Defence Research & Development Organisation (DRDO)** to meet the requirements of the Tri-Services, Defence Production and DRDO.
- The Scheme **encourages participation of public/private industries, especially MSMEs and startups**, so as to create an ecosystem for enhancing cutting edge technology capability in the defense sector.

About POEM:

- **The PSLV Orbital Experimental Module (POEM)** is a platform that will help perform in-orbit experiments using the final, and otherwise discarded, stage of ISRO's Polar Satellite Launch Vehicle (PSLV).
- The PSLV is a **four-stage rocket where the first three spent stages fall back into the ocean, and the final stage (PS4)** after launching the satellite into orbit ends up as space junk.
- **POEM has a dedicated Navigation Guidance and Control (NGC)** system for attitude stabilization, which stands for controlling the orientation of any aerospace vehicle within permitted limits.
- **POEM will derive its power from solar panels** mounted around the PS4 tank, and a Li-Ion battery.

Topic 52. INDIA-MADE TYPHOID VACCINE EFFICACY LASTS FOR FOUR YEARS: STUDY

Important for the subject: Science and technology

A **phase-3 trial** conducted in **Malawi** on **children aged between nine months and 12 years** has demonstrated that the **"Typhbar" typhoid vaccine**, developed by **Hyderabad-based Bharat Biotech**, maintains its **efficacy** for at least **four years**.

- The trial, which is the **first randomised, controlled, double-blind study of its kind** in a **typhoid fever-endemic setting**. The vaccine's efficacy ranges from **70.6%** to over **79%**.
- The study provides **evidence of the vaccine's long-term protection beyond 48 months**, with **minimal decline in efficacy over time**, supporting its **cost-effectiveness**.
- It also notes the **robust immune response** induced by **conjugated typhoid vaccines** in individuals **older than six months**, mentioning two **WHO-prequalified vaccines: Bharat Biotech's Typhbar TCV and Biological E's Vi-CRM197**.
- However, concerns about the potential rebound of **Salmonella Typhi bacteria** in **vaccinated children** due to waning protection suggest the need for further research on the vaccine's long-term efficacy and the possible benefits of a booster dose, with an immunogenicity study of a booster dose currently underway in Malawi.

Typhbar- Typhoid vaccine:

- **Typhbar TCV®** is the **world's first clinically proven conjugate typhoid vaccine**, notable for containing the **polysaccharide of Salmonella typhi Ty2 conjugated to Tetanus Toxoid**.

- This conjugation method enhances the immune response by eliciting T-dependent antibody responses, characterized by the production of high-affinity antibodies and the establishment of long-term immune memory, beyond the basic B cell responses elicited by the Vi capsular polysaccharide alone.
- Significantly, **Typbar TCV®** is the **only typhoid vaccine approved for use in children and infants under 2 years of age**.
- It has received **WHO prequalification**, underscoring its global importance in typhoid fever prevention.

About Typhoid fever:

- It is a **serious infection** caused by **Salmonella Typhi**, a **bacterium** transmitted **exclusively through humans**.
- It **spreads** via the **fecal-oral route**, commonly through **contaminated food or water**.
- Without treatment, **1 in 20** recovered individuals becomes a **symptomless carrier**, capable of infecting others for up to a year.
- **Typhoid fever** is prevalent in parts of **Asia, Africa, the Caribbean, Central and South America**, and the **Middle East**, posing a risk, especially to travellers.
- **Symptoms of typhoid** can range from **mild to severe**, including **fever, fatigue, malaise, sore throat, persistent cough**, and **headache**, lasting about a month without treatment.
- **Prevention is possible through vaccination**, available as a **live, attenuated capsule for individuals over 6 years** or an **inactivated shot for those over 2 years**, administered two weeks before travel. However, the **vaccine's effectiveness ranges from 50–80%**.
- Treatment necessitates **prompt antibiotic administration**. The emergence of **drug-resistant strains**, however, threatens the **efficacy of these treatments**.
- **Multi-drug-resistant (MDR) typhoid**, which shows resistance to **multiple antibiotic classes**, has been a concern but has **declined in Bangladesh and India since 2000**, remained **low in Nepal**, and **slightly increased in Pakistan**.
- A newer threat is **Extensive Drug Resistance (XDR) typhoid**, resistant to **at least five classes of antibiotics**, observed in **India, Bangladesh, Nepal, and Pakistan**, posing a significant public health risk.

Topic 53. THE IMPORTANCE OF KEEPING PERSONALLY IDENTIFIABLE INFORMATION SAFE

Important for the subject: Science and technology

Recently, the Ministry of Corporate Affairs fixed a critical vulnerability in its online portal months after a cybersecurity researcher reported it to the **Computer Emergency Response Team of India (CERTIn)**.

- The vulnerability reportedly exposed personal details like Aadhaar, PAN, voter identity, passport, date of birth, contact number and address of more than 98 lakh directors of Indian companies.

About Personally Identifiable Information

- Personally Identifiable Information (PII) is any data or information maintained by an organisation or agency that can potentially be used to identify a specific individual.
- This could include information such as Aadhaar, PAN, voter identity, passport, date of birth, contact number, communication address, and biometric information

Difference between sensitive and non-sensitive PII

- Sensitive PII, when exposed, can be **used to identify individuals and potentially cause harm**.
- Some of the most important components that constitute sensitive PII are stored by employers, government organisations, banks, and other digital accounts used by individuals.
- **Non-Sensitive PII is publicly available information** and can be stored and transmitted unencrypted. This includes information such as zip code, race, gender, and religion.

What are the risks of PII exposure?

- Threat actors can **gain access to exposed PII and misuse it to launch targeted attacks on individuals**.
- These attacks could range from **phishing attacks** with messages curated with PII information, to **fraudulently opening bank accounts**, and siphoning funds from accounts allotted to beneficiaries of government welfare programmes.
- Attackers may also use such information to obtain cellular connections, credit cards, and compromise the security of an individual's digital accounts.

How can one protect PII?

- **Looking for HTTPS in URLs when visiting** unknown websites. The “S” stands for **secure** and is used by legitimate websites to secure collected information from unsecured connections.
- Some browsers may also use a **lock symbol in the URL bar** to signify that a website is secure.
- **Using a VPN when accessing sensitive information** using public networks. A VPN helps protect PII and other vital data by securing your online connection from prying eyes on public networks.
- Keeping a tab on PII like Aadhaar, passport, PAN, Voter ID, and other important proofs of identity.
- By avoiding sharing or accessing images or details of identity documents through unknown devices. By **avoiding sharing personal information on social media platforms**.
- **Keeping a tab on bank account transactions**, credit cards, and credit score; a hit in the score could mean your PII has been misused to procure credit cards in your name.

Topic 54. VYOMMITRA: ISRO TO LAUNCH INDIA’S FEMALE ROBOT ASTRONAUT INTO SPACE AHEAD OF GAGANYAAN MISSION

Important for the subject: Science and technology

India’s female robot astronaut Vyommitra will fly into space ahead of Indian Space Research Organisation’s (ISRO) ambitious Gaganyaan mission – the country’s manned space flight carrying Indian astronauts into space – said the union minister of science and technology, on Sunday (Feb 4).

About Vyom Mitra:

- The **humanoid** has been developed by the **ISRO Inertial Systems Unit**, Thiruvananthapuram.
- **Vyom Mitra is a half-humanoid** and her body stops at the torso and has no legs.
- The humanoid will simulate the human functions required for space before real astronauts take off.

- She has been **designed to resemble a human with facial expressions and speech and sight**
- Vyommitra is also **set to get a digital twin**. The ‘twin’ will undergo computer simulations where the control systems are tested for microgravity conditions

Capabilities:

- The humanoid can **detect and give out warnings if the environment changes** within the cabin.
- She is capable of **switching panel operations, performing Environment Control and Life Support Systems (ECLSS) functions**, having conversations with the astronauts, recognizing them, and solving their queries.
- The **AI-enabled robot** can withstand vibrations and shock during the flight.

Role of Vyom Mitra:

- Vyommitra will **fly aboard the first unmanned test flight** ahead of the crewed **Gaganyaan flight expected in 2024**.
- It will simulate the exact human functions in space.
- It will check whether the systems are working right.

Topic 55. THE UNUSUAL CABBAGE MUTATION THAT COULD BOOST CROP YIELD

Important for the subject: Science and technology

The males of plants as diverse as cabbage, cauliflower, broccoli, tomato, and rice can be **made sterile by deleting a very small part of their genome’s DNA**.

- This deletion holds the promise of significantly boosting crop yields through a phenomenon known as **heterosis**.

Understanding Genetics

- The cabbage plant (*Brassica oleracea*) genome contains approximately **1.06 billion base pairs distributed across 18 chromosomes**. Each chromosome pair, derived from pollen and egg, shares a mostly identical sequence.

Role of Genes:

- Genes are well-defined DNA sequences, typically spanning a few thousand base pairs. When expressed, a gene's segment is transcribed into RNA, which serves as the blueprint for protein synthesis.
- **Protein Production:** RNA is processed by cellular machinery called ribosomes, directing the assembly of amino acids into proteins.

Role of Sterility in Hybrid Vigor

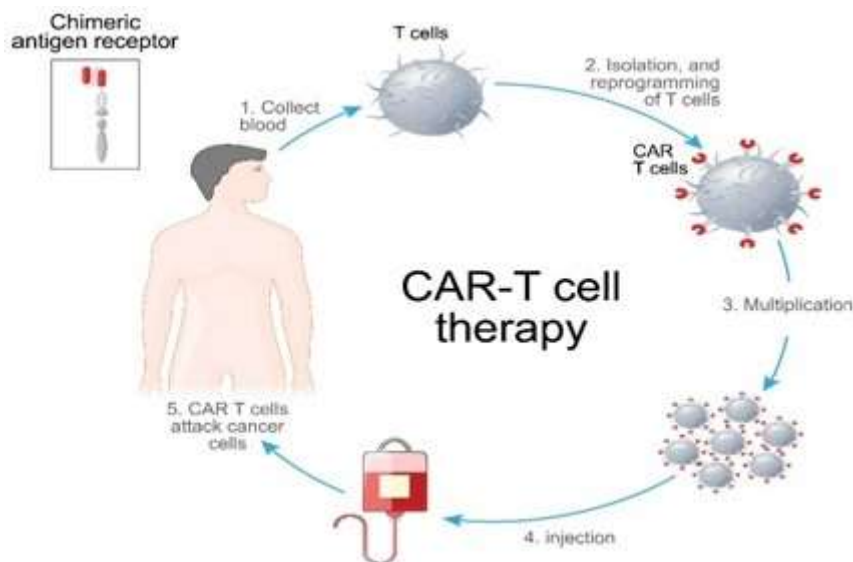
- **Finding of Ms-cd1:** Around 44 years ago, a cabbage plant with a natural mutation known as Ms-cd1 was identified.
- This mutation rendered the plant male-sterile, with a crucial twist: the eggs of the mutant plant could still be fertilized by pollen from normal plants, yielding normal seeds.
- **Hybrid Seeds:** All seeds from mutant plants resulted from out-crossing, where eggs were fertilized by pollen from different strains. **Such hybrid seeds, also called out-cross seeds, give rise to more robust plants with enhanced vigor, known as heterosis.**
- **Dominant Mutation:** The Ms-cd1 mutation was found to be dominant, meaning its presence in just one chromosome of the pair caused male sterility, regardless of the other chromosome's status.
- **Recessive Mutations:** The researchers demonstrated that mutations in both copies of the Ms-cd1 gene were necessary for male fertility. In such cases, the mutations became recessive.

Crucial Missing Base-Pair

- **Genetic Mapping:** Through genetic mapping, researchers identified a crucial distinction between the mutated and non-mutated Ms-cd1 genes. The mutated gene lacked a single DNA base pair in its promoter region.
- **Promoter's Role:** The promoter sequence binds to regulatory proteins that control when and in which cells a gene is transcribed into RNA.
- **ERF Binding:** In the mutated gene, this missing base-pair disrupted its binding to the regulatory protein ERF, **allowing the Ms-cd1 gene to remain expressed, leading to male sterility.**
- **Fine-Tuning of Protein Levels:** Proper pollen development depends on a precise balance of Ms-cd1 protein levels, with ERF binding regulating its expression at different stages of development.

Topic 56. INDIGENOUS CAR-T CELL THERAPY GETS ROLLING: 'FIRST' PATIENT IS CANCER-FREE

Important for the subject: Science and technology



Chimeric antigen receptor T cells are T cells that have been genetically engineered to produce an artificial T-cell receptor for use in immunotherapy. Chimeric antigen receptors are receptor proteins that have been engineered to give T cells the new ability to target a specific protein.

- An 11-year-old has become the first patient to receive CAR-T therapy (immunotherapy) that uses the body's own cells to fight cancer. CAR-T is a **personalized form of cancer treatment**.
- CAR-T involves removing immune cells and modifying them in a laboratory so they can recognize cancer cells.
- Immunotherapy is treatment that **uses your body's own immune system to help fight cancer**.
- First, the patient has blood removed and the white blood cells are separated out, with the rest of the blood being returned to the patient.
- A harmless virus is used to insert genes into T-cells, a special type of immune cell. These genes cause the T-cells to add a hook on to their surface, known as a chimeric antigen receptor (CAR).
- These engineered CAR-T cells – programmed to recognize and destroy the patient's cancer cells – are multiplied in huge numbers and then infused back into the patient.

Topic 57. ACQUISITION OPPORTUNITIES FOR INDIAN OIL AND GAS COMPANIES IN NORTH SEA

Important for the subject: Geography

Region Exploration:

Indian oil and gas firms should **explore hydrocarbon assets in regions like the North Sea (UK) and East Mediterranean.**

Potential for **creating long-term value** is a crucial consideration.

Expansion Mindset:

- Companies need to **expand their horizons** and not solely focus on short-term bargains.
- Deals are happening globally, **emphasizing the need to look beyond current market conditions.**

Value Over Price:

- Emphasis on analyzing the **long-term value** an asset can generate rather than solely focusing on current market prices.
- Recent examples like **Harbour Energy's \$9 billion deal in the North Sea highlight the importance of looking at value over price.**

Consideration of Stable Regions:

- Regions like the **North Sea** offer high-quality and mature assets.
- **Stable political environment, tax structures, and government relations** are key factors.

Diversification Beyond Relationships:

- While maintaining good relationships is important, **companies should also diversify beyond familiar partnerships.**
- Past challenges in regions like Venezuela and Sakhalin-I (Russia) highlight the need for a broader perspective.

Geographical Examples:

- **Alaska:** Presents opportunities but is challenging due to weather conditions.
- **Eastern Mediterranean:** Significant gas province **with stable relationships with India (Egypt, Cyprus, Israel).**

International Legislation:

- 1958 Geneva Convention on the Continental Shelf establishes **rights of countries over continental shelves. Paved the way for exploration in the North Sea.**

Evolution of North Sea Drilling:

- **1958 Geneva Convention:** First international legislation establishing countries' rights over continental shelves.
- **1964 Continental Shelf Act:** Solidified the U.K.'s jurisdiction over oil and gas resources.
- **BP's Exploration:** Secured the first license in 1964, leading to the discovery of natural gas in 1965.
- **Commercial Oil Discovery:** Forties Field, east of Aberdeen, Scotland in 1970.
- **Increased Exploration:** Various companies engaged in exploration in the following decades.

Oil and Gas in Eastern Mediterranean Sea

- Over the past decade, the Eastern Mediterranean has witnessed the discovery of a number of gas fields in the Exclusive Economic Zones (EEZs) of regional countries while further exploration and drilling activities are going on.
- According to estimates included in two reports from the United States Geological Survey released in 2010, vast energy reserves are deposited in both the Nile Delta and the Levant basins in the Eastern Mediterranean.
- Further deposits are estimated in the **Aegean and Ionian Seas**. Among the regional countries, Egypt and Israel have made a head start with commercial drilling and supplies through pipeline.
- Israel has invested in **Mari-B, Noa, Tamar and Leviathan gas fields**, while Egypt has invested in the **Zohr and Noor gas fields**.
- Moreover, after the Israel–Lebanon maritime delimitation deal, Israel is expected to start production at **the Karish gas field**, while Lebanon is likely to accelerate drilling at the Qana field.
- The success of Egypt and Israel in finding commercial quantities and starting production from onshore gas fields has encouraged others, including **Greece, Cyprus and Northern Cyprus, Turkey, Lebanon, Libya** and Syria, to seriously undertake exploration activities.
- Simultaneously, the possibility of the Eastern Mediterranean region emerging as a new gas production hub has led to efforts at reconciliation and joint exploration.
- For example, an informal bloc among Egypt, Israel, Greece and Cyprus took formal shape as the **Eastern Mediterranean Gas Forum (EMGF) in 2019.**

- The EMGF, based in Cairo, aims to develop a cooperative mechanism among member countries for exploration, infrastructure development and to supply gas to European and Asian markets.
- Likewise, the possible economic benefits of gas production and exports encouraged Israel and Lebanon, that otherwise do not share formal ties, to sign a US-mediated maritime demarcation agreement in October 2022.

North Sea:

- **Geographically**, the **North Sea** lies between **England** and **Scotland** on its **west**, the **Netherlands**, **Belgium**, and **France** on its **south**, and **Norway**, **Denmark**, and **Germany** on its **west**.
- An **epeiric sea** (an inland sea either completely surrounded by **dry land** or connected to an ocean by a river, strait or “arm of the sea”) on the **European continental shelf**.
- It **connects** to the **Atlantic Ocean** through the **English Channel** in the **south** and the **Norwegian Sea** in the **north**.
- It hosts **key north European shipping lanes** and is a **major fishery**. The coast is a popular destination for recreation and tourism in bordering countries, and a rich source of energy resources, including wind and wave power.

Topic 58. POPULATION PRIORITIES

Important for the subject: Geography

The Union Finance Minister Nirmala Sitharaman said that a **high-powered committee** will be constituted to consider the **challenges arising from “fast population growth and demographic changes”**. But no survey can substitute the Census, which is yet to be conducted for this decade.

Census in India

- Basic data on the state of human resources, demography, culture, and economic structure at the local, regional, and national levels are provided by the Population Census.
- In India, the census enumeration process is carried out every ten years, having started with the first non-synchronous census in 1872.
- The first synchronous census was conducted in 1881 by Census Commissioner of India W.C. Plowden, during the British colonial era.
- The Ministry of Home Affairs’ Office of the Registrar General and Census Commissioner of India is in charge of carrying out the decadal census.
- The Indian Constitution’s Union List, entry 69, contains information about population censuses.
- The 1948 Census Act governs how the census is carried out.

Postponing the decennial Census

- With the Union government repeatedly postponing the decennial Census — it **has not been conducted for the first time in a decade since 1881.**
- It is evident that India is now the most populous country, but the Sample Registration System statistical report in 2020 and,
- The National Family Health Survey-5 (2019-21) have shown that the **total fertility rate (TFR) in India has fallen to 2 overall**, with only a few States — **Bihar (2.98), Meghalaya (2.91), Uttar Pradesh (2.35), Jharkhand (2.26) and Manipur (2.17)** — having a TFR above 2.1.
- Clearly, the **high population growth of the kind seen in the 20th century has been largely arrested** — the TFR fell from 5.7 in 1950 to 2 in 2020, albeit differentially across regions.
- The **population share of the southern States, reduced to 21% in 2011 from 26% in 1951**, largely a consequence of a rapid reduction in TFR due to better socio-economic outcomes and education, and despite higher migration to these States.

Role of Surveys

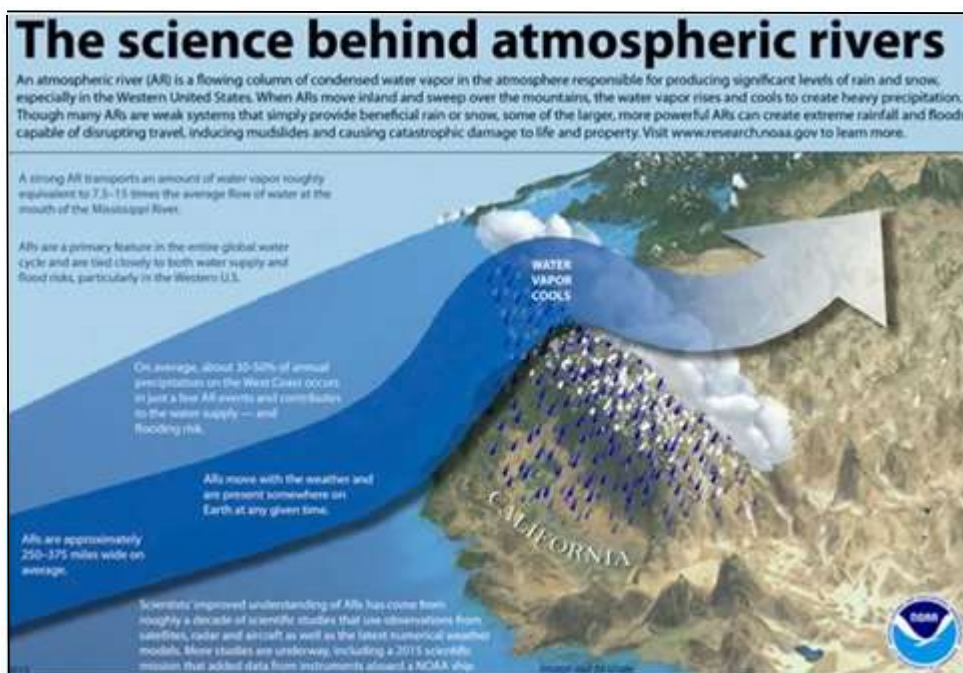
- While the **surveys mentioned are robust and necessary**, they are no substitute for the comprehensive Census; the **continued delay in its implementation reflects poorly on the Union Home Ministry** that is motivated by other priorities rather than executing a vital programme of Indian governance.

Democracy shift in India

- The demographic shift in India and rising life expectancy have **resulted in challenges and opportunities.**
- The **much-touted demographic dividend** — the relatively high proportion of the working age population in the developing world — is **meaningful only if there are sufficient jobs** and if they enjoy some degree of social security that will help them when they age.
- With **high unemployment and the creation of non-farm jobs**, which will increase productivity and cater to skilled employment, relatively slack in the last few years, there is the **possibility of the country squandering this dividend.**
- The **“high-powered” committee** will be performing a crucial role if it engages meaningfully in **addressing questions related to jobs and social security** and the challenges citizens face due to rapid urbanization and mechanization of work.

Topic 59. ATMOSPHERIC RIVERS

Important for the subject: Geography



Southern California has been inundated with massive rainfall, with the risk of landslides rising on the soaked ground.

- The rainfall has been caused by an ‘atmospheric river’, and is likely to bring in both positives and negatives for the region.
- Atmospheric rivers are long, narrow bands of moisture in the atmosphere that extend from the tropics to higher latitudes. These rivers in the sky can transport 15 times the volume of the Mississippi River.
- When that moisture reaches the coast and moves inland, it rises over the mountains, generating rain and snowfall. Many fire-weary westerners welcome these deluges, but atmospheric rivers can trigger other disasters, such as extreme flooding and debris flows.
- Atmospheric rivers occur globally, affecting the west coasts of the world’s major land masses, including Portugal, Western Europe, Chile and South Africa.
- So-called “Pineapple Express” storms that carry moisture from Hawaii to the United States West Coast are just one of their many flavors.
- In the 1960s meteorologists coined the phrase “Pineapple Express” to describe storm tracks that originated near Hawaii and carried warm water vapor to the coast of North America.

- By the late 1990s atmospheric scientists had found that over 90 per cent of the world's moisture from the tropics and subtropics was transported to higher latitudes by similar systems, which they named "atmospheric rivers."
- Atmospheric rivers are predicted to grow longer, wetter and wider in a warming climate.
- Greenhouse gases trap heat in the atmosphere, warming the planet. This causes more water to evaporate from oceans and lakes, and increased moisture in the air makes storm systems grow stronger.
- In dry conditions, atmospheric rivers can replenish water supplies and quench dangerous wildfires. In wet conditions, they can cause damaging floods and debris flows, wreaking havoc on local economies.
- Atmospheric river classification scale ranks the storms from 1 to 5, similar to systems for categorizing hurricanes and tornadoes. Atmospheric River category 1 (AR1) and AR2 storms caused estimated damages under \$1 million.
- AR4 and AR5 storms caused median damages in the 10s and 100s of millions of dollars respectively.
- The most damaging AR4s and AR5s generated impacts of over \$1 billion per storm. These billion-dollar storms occurred every three to four years.
- The most significant finding was an exponential relationship between the intensity of atmospheric rivers and the flood damages they caused. Each increase in the scale from 1 to 5 was associated with a 10-fold increase in damages.

Topic 60. INDIA TO SEE \$67 BN IN ENERGY INVESTMENTS IN NEXT 5-6 YEARS: PM

Important for the subject: Geography

Prime Minister announced **India's aim to increase the share of domestic gas in its primary energy mix** from the current **6%** to **15%** as a move towards more environmentally friendly energy sources.

- This initiative is expected to attract an investment of about **\$67 billion** over the **next five to six years**.
- **India's energy demand** is projected to **double by 2045**, and in anticipation, the country is focusing on **developing affordable and sustainable energy**.
- There is an '**unprecedented infrastructure push**' with **₹11 lakh crore** allocated for it in the **interim budget**, underlining the government's commitment to enhancing India's energy infrastructure.

'Big part for energy':

- A significant portion of the allocated **₹11 lakh crore** will be invested in the **energy sector**, supporting the **development of infrastructure** in **railways, roadways, waterways, airways, and housing**, all of which will **increase energy demand** and aid in expanding **India's energy capacity**.
- Additionally, he highlighted the **Global Biofuel Alliance**, introduced during the **G20 Summit in India**, which has garnered support from **22 nations** and **12 international organizations**.
- This alliance **aims** to promote the **use of biofuels**, potentially unlocking economic opportunities valued at **\$500 billion**.

About Global Biofuels Alliance:

- It is an **India-led Initiative** to develop an **alliance of Governments, International organisations and Industry** to **facilitate the adoption of biofuels**.
- A total of **19 countries** and **12 international organisations** have so far agreed to join the alliance, including both **G20 members** and **non-member countries**.
- **India, Brazil** and the **US** is the **founding members** of the alliance.
- This Alliance will be **aimed** at facilitating cooperation and intensifying the use of **sustainable biofuels**, including in the transportation sector.

Significance of the alliance

- It will place **emphasis on strengthening markets, facilitating global biofuels trade, developing concrete policy lesson-sharing and providing technical support for national biofuels programs worldwide**.
- It will support **worldwide development and deployment of sustainable biofuels by offering capacity-building exercises** across the value chain, technical support for national programs and promoting policy lessons-sharing.
- It will **facilitate mobilising a virtual marketplace** to assist **industries, countries, ecosystem players and key stakeholders in mapping demand and supply**, as well as **connecting technology providers to end users**.
- It will also facilitate the **development, adoption and implementation** of internationally recognised **standards, codes, sustainability principles and regulations** to incentivise biofuels adoption and trade.

Ethanol blending push:

- **Ethanol blending in petrol** has **increased** from **1.5% in 2014** to **12% in 2023**, resulting in a reduction of approximately **42 million metric tons in carbon emissions**.

- The government **aims** to achieve a **20% ethanol blending rate** in **petrol** by **2025**. The government has established **5,000 compressed biogas plants** to further enhance **India's energy sustainability**.

Ethanol Blended Petrol (EBP) Programme:

- The Ethanol Blended Petrol Programme was launched in 2003 with an aim to promote the use of renewable and **environmentally friendly fuels** and reduce **India's import dependence for energy security**.
- Starting with 5% blending, the government has set a target of 10% ethanol blending by 2022 and **20% blending (E20) by 2030**.
- The programme is **implemented in accordance with the National Policy on Biofuels**.
- Under this programme, oil marketing companies (OMCs) **will procure ethanol from domestic sources at prices fixed by the government**.
- Till 2018, only sugarcane was used to derive ethanol. Now, the government has extended the ambit of the scheme to include food grains like maize, bajra, fruit and vegetable waste, etc. to produce ethanol.

Generations of biofuels

- **First generation biofuels** – First-generation biofuels are **made from sugar, starch, vegetable oil, or animal fats using conventional technology**.
- Common first-generation biofuels include Bio-alcohols, Biodiesel, Vegetable oil, Bio-ethers, Biogas.
- **Second generation biofuels** – These are **produced from non-food crops**, such as cellulosic biofuels and waste biomass (stalks of wheat and corn, and wood). Examples include advanced biofuels like bio-hydrogen, bio-methanol.
- **Third generation biofuels** – These are produced **from micro-organisms like algae**.
- **Four Generation Bio-fuels**-It uses genetically modified (GM) algae to enhance biofuel production.

Topic 61. BACK FROM ARCTIC WINTER VOYAGE, SCIENTISTS 'HAPPY TO SEE SUN' AGAIN

Important for the subject: International Relations

Girish was part of the four-member scientific team that became the first set of researchers from India to spend a winter carrying out scientific studies in the world's northernmost habitation.

- India is only the fourth country in the world, after Germany, Italy and Norway, to have a year-round scientific presence in the Arctic region.

- India has had a permanent research station called Himadri, in Ny-Ålesund in the Norwegian archipelago of Svalbard in the Arctic region since 2008.
- Scientists have proposed to conduct the characterisation of the radio frequency environment in the Arctic, the first attempt ever from this region.
- The experiments required the Indian researchers to drive an electric car to the Grave Badet laboratory which is located around 1.25 km from Himadri.
- India shares this lab with Italy and Japan.
- A Maxwell Antenna and an Electric Field Mill has been deployed at the Arctic to detect the atmospheric electric current and field respectively
- This will help scientists in gathering information about the Global Atmospheric Electrical Circuit and better understand lightning.

The Himadri station and India's facilities in the Arctic:

- It is situated in the **Ny-Alesund region of Svalbard**, Norway.
- It is India's first permanent Arctic research station.
- It is located at a distance of 1,200 kilometers (750 mi) from the North Pole.
- India has an atmospheric science facility called Gruve Badet Observatory that houses various atmospheric observation networks.
- The country has initiated new scientific projects in the Canadian High Arctic (Nunavut region) and plans to initiate studies in Greenland soon.

National Centre for Polar and Ocean Research (NCPOR):

- The NCPOR, formerly known as the National Centre for Antarctic and Ocean Research (NCAOR) is an Indian research and development institution, situated in Vasco da Gama, Goa.
- It is the nodal agency for India's polar expeditions.
- It is an autonomous institution of the Department of Ocean Development (DOD), Ministry of Earth Sciences.
- Government of India which is responsible for administering the Indian Antarctic Programme and maintains the Indian government's Antarctic research stations, Bharati and Maitri.

Topic 62. BRICS AND BRICS PLUS

Important for the subject: International Relations

Egypt, Ethiopia, Iran, Saudi Arabia and the United Arab Emirates have confirmed that they are joining the BRICS bloc.

- The five countries were extended invitations along with Argentina at a summit in August in Johannesburg to join the bloc comprising **Brazil, Russia, China, India and South Africa**.
- Members say the move would help reshuffle a world order they view as outdated.

About BRICS:

- BRICS is an acronym for the grouping of the world's leading emerging economies, namely **Brazil, Russia, India, China and South Africa**.
- The term BRIC was coined by **Jim O' Neil, the then chairman of Goldman Sachs** in 2001.
- The first BRIC summit took place in the year **2009 in Yekaterinburg (Russia)**.
- In 2010, South Africa formally joined the association making it BRICS. The BRICS Leaders' Summit is convened annually.
- The Chairmanship of the forum is rotated annually among the members, in accordance with the acronym B-R-I-C-S.
- Together, BRICS accounts for about 40% of the world's population and about 30% of the GDP (Gross Domestic Product), making it a critical economic engine.
- During the Sixth BRICS Summit in Fortaleza (2014) the leaders signed the Agreement establishing the New Development Bank (NDB), headquartered in Shanghai.
- The Fortaleza Declaration stressed that the NDB will strengthen cooperation among BRICS and will supplement the efforts of multilateral and regional financial institutions for global development thus contributing to sustainable and balanced growth.
- Considering the increasing instances of global financial crisis, BRICS nations signed BRICS Contingent Reserve Arrangement (CRA) in 2014 as part of Fortaleza Declaration at Sixth BRICS summit.
- The BRICS CRA aims to provide short-term liquidity support to the members through currency swaps to help mitigate the BOP crisis situation and further strengthen financial stability.
- The initial total committed resources of the CRA shall be one hundred billion dollars of the United States of America (USD 100 billion).

About BRICS PLUS:

- BRICS Plus is a global platform fostering innovation, diverse collaboration, and sustainability in 186 countries.
- With plans to include **Argentina, Egypt, Ethiopia, Iran, Saudi Arabia, and the UAE** in 2024 it is committed to global economic advancement.
- BRICS+ Platform is shaping a future of innovation and positive impact worldwide.
- BRICS Plus was first mooted by Chinese Foreign Minister Wang Yi in March 2017 with the objective of widening the “circle of friends” of BRICS that can bring unity among developing countries and enhance South-South cooperation.

Topic 63. NEARLY 400 ETHIOPIANS HAVE DIED OF STARVATION

Important for the subject: International Relations

The **Ethiopian national ombudsman** has reported nearly **400 starvation deaths** in the **Tigray and Amhara regions**, acknowledging **hunger-related fatalities** amidst a backdrop of **drought** and the aftermath of a **civil war** that concluded 14 months ago.

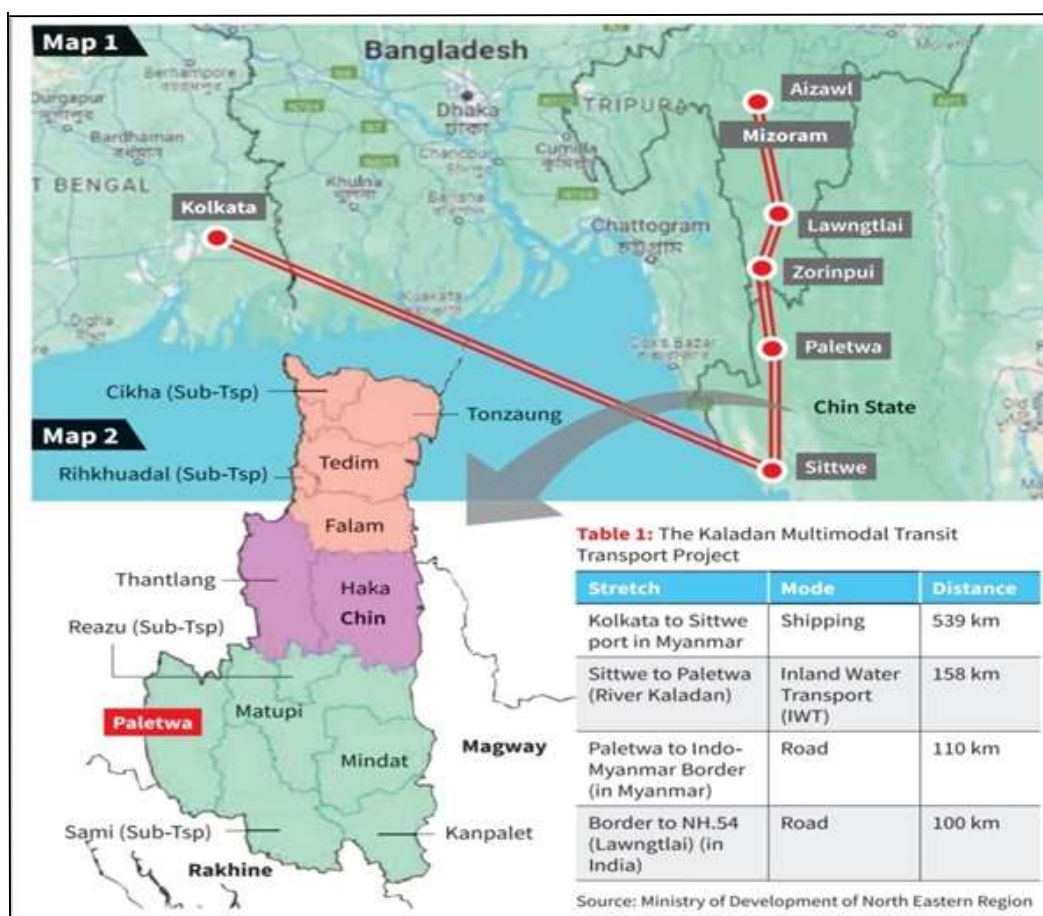
- The **slow pace of aid distribution** is compounded by **logistical and technical challenges**, including the **introduction of new systems** like **GPS trackers for food trucks** and **QR codes for ration cards**, which have faced implementation difficulties.
- The **pause in food aid** by the **U.N.** and the **U.S.** last year, due to a **large-scale theft scheme**, significantly exacerbated **hunger levels**.
- The recent **conflict in Tigray**, which resulted in significant casualties and displacement, has led to accusations against the **Ethiopian government of using starvation as a method of warfare**.
- The current crisis threatens to mirror the **catastrophic famine of the mid-1980s** unless immediate action is taken to scale up the aid response, despite federal government denials of a widespread hunger crisis.

Tigray war:

- The Tigray War was an **armed conflict** that lasted from **3 November 2020** to **3 November 2022**.
- The war was **primarily fought** in the **Tigray Region** of **Ethiopia** between **forces allied to the Ethiopian federal government and Eritrea on one side**, and the **Tigray People's Liberation Front (TPLF) on the other**.

Topic 64. MYANMAR'S CIVIL WAR AND INDIA'S INTERESTS

Important for the subject: International Relations



About News:

A few weeks ago, the Arakan Army captured **Paletwa** in the Chin State which lies on Myanmar's western borders with Bangladesh and India.

- The developments in Paletwa will impact the Indian government's **Kaladan Multimodal Transit Transport Project (KMTTP) in Myanmar**, which has already faced significant delays.
- The Arakan Army, along with the Myanmar National Democratic Alliance Army and the Ta'ang National Liberation Army, is part of the **Three Brotherhood alliance**, which some claim has China's support.
- Unlike India, **China is a permanent member of the United Nations Security Council**, which prompts many state and nonstate actors in need of international support to be relatively more accommodating of China's concerns.

Kaladan Multi-Modal Transit Transport Project:

- Kaladan Project would link India and Myanmar via the Bay of Bengal.
- It was jointly identified by India and Myanmar to create a multi-modal mode of transport for the shipment of cargo from the eastern ports of India to Myanmar as well as to the North-Eastern part of India through Myanmar.
- It is being constructed by India under the Grant in Aid Scheme.
- Once completed, it will link Kolkata with the Sittwe seaport in Rakhine state in Myanmar, primarily over the Bay of Bengal – covering over 500 km. The project envisaged four important stages:
 - Kolkata to Sittwe waterway;
 - Sittwe to Paletwa inland (River Kaladan) waterway;
 - Paletwa to India-Myanmar border post in Myanmar;
 - Finally, linking the road to Lawngtlai in Mizoramas part of the project's last leg;

Benefits:

- The project is expected to contribute to the economic development of the North-Eastern States of India.
- It also provides a strategic link to the North-East, thereby reducing pressure on the Siliguri Corridor.

Topic 65. PLAN TO RESURFACE A PYRAMID IN GRANITE DRAWS HEATED DEBATE

Important for the subject: History



A project to restore granite blocks that once covered a greater portion of the **Pyramid of Menkaure in Giza** has been criticized by some preservationists.

- The initiative was announced by **Mostafa Waziri, the secretary general of Egypt's Supreme Council of Antiquities**, who called it “the project of the century”.

- The debate over the pyramid reflects a constant tension in the field of conservation: whether to try to return ancient structures to their earlier splendour or minimize intervention as much as possible.

About Pyramids:

- Almost every ancient culture and civilization, be it **Mesopotamian, Chinese, Egyptian, or Mayan, has left a legacy of towering ancient pyramids.**
- A pyramid is a structure whose visible surfaces are triangular and converge to a point at the top, making the shape roughly a pyramid in the geometric sense.
- The base of a pyramid can be of any polygon shape, such as trilateral or quadrilateral.
- The **Great Pyramid of Cholula, also known as Tlachihualtepetl is the biggest archaeological site of a pyramid (temple) in the New World.**
- The **Step Pyramid Of Djoser**, a 4,700-year-old step pyramid in Egypt, built in the 27th century BC is the oldest pyramid on Earth.
- A specific count of pyramids across the world has not been done. Egypt, which is most renowned for its pyramids, has 118 pyramids.
- The **Great Pyramid of Giza is the largest Egyptian pyramid** and served as the tomb of pharaoh Khufu, who ruled during the Fourth Dynasty of the Old Kingdom.
- The **Great Pyramid was the world's tallest human-made structure** for more than 3,800 years.
- The **Pyramid of Menkaure** was built to house the tomb of **King Menkaure**, who ruled **Egypt more than 4,000 years ago.**
- It is the only one of the three main pyramids at Giza that was encased in multiple levels of **Aswan granite, a red stone** that comes from quarries more than **550 miles south of Giza.**

Pyramids From Around The World To Witness

- **Pyramid of Djoser – Saqqara, Egypt (2660 BCE)**
- While there are over a hundred pyramids in Egypt, **the Pyramid of Djoser is the oldest.**
- Built by the **Pharaoh Djoser (Zoser)**, this step pyramid predates those at Giza by more than a century. Before this, pharaohs' tombs were flat-topped mounds.
- It was Djoser's chief architect, Imhotep, who placed these mounds one on top of the other, creating the **Pyramid of Djoser**, the world's first-step pyramid.
- Djoser was the first king of the **Third Dynasty of Egypt.**

Pyramid of the Sun – Teotihuacan, Mexico (100 CE)

- The **central Mexican city of Teotihuacan is an architectural marvel**, filled with intricate structures and massive step pyramids.
- The most impressive of these is the 240-foot-tall Pyramid of the Sun, constructed in five layers.
- It is located along a **central Avenue of the Dead** which also connects it to a smaller Pyramid of the Moon.
- The material used to construct this awe-inspiring structure was hewed tezontle, a red coarse volcanic rock of the region.
- On the west side of the pyramid, there are **248 uneven stair steps that lead to the top of the structure.**

El Castillo – Yucatan, Mexico (1000 CE)

- One of the **most spectacular Mayan temples**, the 98-foot-tall Chichen Itza pyramid nicknamed **El Castillo, or the Temple of Kukulcan**, has special astronomical significance.
- Each of its faces has 91 steps, which, when combined with the shared step at the top, make 365 steps, one for each day of the year.
- This massive structure is situated near the small town of Pisté and you can get there by bus from the airports of **Mérida and Cancun or other Mexican cities.**
- A fascinating feature of this pyramid is that during the spring and autumn equinoxes, light and shadow form a series of triangles on the side of the north staircase.

Prang Temple – Koh Ker, Cambodia (940 CE)

- Ancient **Khmer Pyramid, Koh Ker Temple** near Siem Reap town, Cambodia
- Once the ancient capital of Cambodia, Koh Ker was home to almost 100 temples, most of which are still standing.
- Among the structures and pyramids built under the reign of **Jayavarman IV, this seven-tiered and 118-foot-tall pyramid is truly unparalleled.**
- However, very few of its beautiful sculptures are left at the site, having either been looted over the years, or placed in museums by the government.
- Koh Ker is an offbeat destination that not many tourists are aware of.
- The temple complex was once ridden with landmines and has only recently been open to the public.
- There are several temple ruins to explore in Koh Ker making it the perfect destination for history buffs.

Pyramid of Khufu – Cairo, Egypt (2560 BCE)

- When most **people think of Egyptian pyramids**, the towering Pyramids of Giza probably come to mind.
- Of the three, it is the pyramid built for Pharaoh Khufu, known as the Great Pyramid, that was, for millennia the largest manmade structure in the world and still remains a popular site.
- It is also the **only remaining wonder of the ancient world**.
- This famous pyramid contains an estimated 2,300,000 blocks, some of which are upwards of 50 tons.
- **Khufu's pyramid is constructed of inner**, rough-hewn, locally quarried core stones, which is what we can still see today.

Borobudur Temple – Java, Indonesia (800 CE)

- Considered the world's **largest Buddhist temple**, the nine stacked platforms of the Borobudur Temple may not be considered a traditional pyramid, but it is truly majestic.
- **Constructed in the 9th century by the Sailendra Dynasty**, its traditional Javanese Buddhist architecture shows the influences of Indian Gupta art.

Tikal – Peten, Guatemala

- The Tikal ruins are the **biggest attraction of Tikal National Park, which was established in the 1950s and designated a UNESCO World Heritage site in 1979.**
- Tikal reached its artistic peak between 600 and 800 after which it suffered significant artistic deterioration.
- **Tomb of the General – Ji'an, China (400 CE)**
- **Ziggurat of Ur – Iraq (2000 BCE)**
- **Tomb of Kashta – Meroe, Sudan (500 BCE)**
- **Borobudur Temple – Java, Indonesia (800 CE)**
- **Bent Pyramid – Dahshur, Egypt (2600 BCE)**
- **Pyramid of Cestius – Rome, Italy (12 BCE)**
- **Sukuh – Java, Indonesia (15th century CE)**